

# THE IRON AGE

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## Further Improvement

### Idle Steel Mills Resuming Operations

#### Wire Products Reduced \$2 Per Ton

An improvement in demand is quite unusual in June and hence this year's developments are highly gratifying. The volume of business is increasing, being larger in nearly every branch of the iron trade, including pig iron. The prices now being made are evidently proving attractive to buyers. The bookings of the United States Steel Corporation are steadily increasing, and this week its steel plants are operating to fully 66 per cent. of their ingot capacity, against 63½ per cent. last week, being the best showing made for two months.

A feature of the current pig iron market is the disposition of large consuming interests to buy under cover. This has been noteworthy in practically every iron center. The inference is naturally strong that the large buyers desire to avoid reports of their purchases becoming public and thus having an effect on prices, as the pig iron market is exceedingly sensitive and news of heavy buying would speedily cause sellers to ask more money. These consumers have won out in their long struggle to get Southern No. 2 foundry iron down to \$10, Birmingham. The producers made a stubborn stand when \$11 was reached on the downward move, and from that point they have given way very gradually, only a few cents at a time. Other foundry irons have of course been affected to some extent by the settling of Southern iron.

Prices of wire rods, wire nails and fence wire have been reduced \$2 per ton, effective June 21. Prices in these lines are now back to the level of last January. This readjustment brings prices of wire products more in line with the new prices of bar products.

An indication of the improved condition of the steel trade is shown in the starting up of the steel plant and rail mill of the Tennessee Coal, Iron & Railroad Company at Ensley, Ala., last Monday. The plant resumes operations with sufficient orders booked to assure operations until September 1, before which time other work will undoubtedly be secured. Next week the Carnegie Steel Company's rail mill at Youngstown, Ohio, will start on rails, which it has not made for several months, and will roll open-hearth rails for export.

The improved condition of the steel trade is further shown by the increase in specifications on contracts. The rail and billet sales department of the Carnegie Steel Company, for instance, reports orders for rails, billets and sheet bars sent to its mills for rolling up to and including June 20 exceeded the same period in May by 28,000 tons. Eastern Pennsylvania steel works are feeling the improved demand as well as those at Pittsburgh and further west.

An interesting incident of the week was a contract

for 50,000 tons of steel car material, consisting of shapes and plates, which was placed by the Canadian Car & Foundry Company with the United States Steel Products Company. It is stated that the Canadian company has orders for all the steel cars it can possibly turn out for months to come. Good orders have also been received from Canada by other American companies for skelp, billets, etc.

About 10,000 tons of large structural work has been placed in the New York district in the past week, including 2300 tons for the Cuylar Realty Building, 3500 tons for railroad bridge work and several contracts for apartment houses and other buildings. The Lackawanna Steel Company will furnish the 5000 tons of steel for the telephone building for which the fabricating contract was placed some time ago.

Among the rail orders for which contracts were taken were 10,000 tons of 90-lb. open-hearth for the Great Northern and 4800 tons for the Kansas City Southern.

The sale is reported of 500,000 tons of low-grade Lake Superior non-Bessemer iron ore to the Bethlehem Steel Company for delivery extending over a period of 10 years.

Pig tin has receded from its high point and is now 2 cents per pound cheaper, the market apparently returning to a more normal condition. In the past two weeks the sales of copper are reported to have been the heaviest in any fortnight this year. Lake copper sold up to 12.90 cents. Spelter and lead are both higher. Spelter has advanced \$4.50 to \$5 per ton within the week.

### The Business Outlook

Confidence is expressed, even in conservative circles, that this fall will bring a decided change for the better. For some time the impression has been strengthening that the worst of the recession in business has been seen and that the shrinkage in consumption or in purchases is not likely to extend much further. Our market reports last week showed that even Pittsburgh, which has so long been in the depths of despondency, has begun to take a more cheerful view of the situation. In the steel trade the recent reductions in prices, instead of causing buyers to hold off for further concessions, have been accepted by important consuming interests as marking a fairly firm level on which to base their arrangements for not only immediate requirements but for some little time in the future.

Looking beyond the limits of the iron and steel trades much has recently happened to give business men encouragement in forecasting conditions for the last half of the year. Our agricultural interests are in most promising shape. The wheat crop bids fair to surpass anything previously harvested. The prospect for corn was never better. The cotton crop appears likely to establish a new record. All other products of the farm, except possibly hay, are promising a most abundant yield. The acreage under cultivation in this country in every line is much in excess of that of any previous year, so that even though deterioration has been or may be experienced in some localities the total for the country will be more than satisfactory. The great basis of the prosperity of this country thus seems to be well established. The railroads may expect to have an enormous traffic in the transportation of agricultural products, while the farmers will be assured of a retention of the splendid purchasing power which has made them

such excellent customers for all kinds of manufacturers of merchandise.

That the country has steadily been getting into better financial shape is shown by the very satisfactory condition of our foreign trade, our excess of exports over imports for the eleven months ended with May standing at \$501,759,316, which surpasses any recent period of eleven months except that ended with May, 1908, immediately after the panic. Our credit abroad has thus so greatly improved that we are more likely to import than to export gold. Perhaps never before were our financial interests in better shape to handle the marketing of the crops this fall and to furnish the necessary funds for the expansion in business which is expected to come. The great oversubscription to the \$50,000,000 of Panama 3 per cent. bonds at a premium of over 2 per cent. is a magnificent testimonial to the financial strength of the country, as no other country has in recent years enjoyed such high credit. The political conditions are not overlooked in this connection, but they are not considered as of a sufficiently menacing character to warrant the fear of their disturbing the resumption of the march in the direction of prosperity which now promises to set in with the approach of autumn.

### The Economic Crime of Increasing Productive Capacity

The American Metal Market attacks the Gary policy of cooperation for its encouragement of an increase in productive capacity. It claims that this policy, "which means maintaining prices and dividing the tonnage, far from curbing new erection in time of slack demand, or excess of capacity over requirements, actually encourages it. New blast furnaces, new steel works, new finishing mills are being built galore. Only a few days ago one of the important independent companies reached its final decision to add a large open-hearth steel plant to its present Bessemer plant." It proceeds to say "this encouragement of new erection under conditions existing for the past four years is an economic crime."

These are strong words, such as might be written by some stockholder of the United States Steel Corporation who is not in sympathy with the management and who feels like holding it responsible for everything happening in the iron and steel world which would seem to be increasing the competition with the corporation. From the standpoint of such a criticism there should have been an absolute cessation of all improvements in existing plants or additions to existing capacity or new construction from the time that the recession in the steel trade began. Apparently it would matter not whether a steel manufacturer who had his plans carefully matured before the recession began should consider that it would be wise for him to proceed with the improvement during the period of slack business, because he would be able to make more favorable contracts for construction and equipment than after the depression had passed. There would be no excuse for a manufacturer who needed some addition to his plant to balance either his requirements for raw material or his necessity for another finishing departments to work up his excess production in a cruder form. Such a critic would not admit the possession of any sagacity whatever by owners of unimproved resources or of a specially advantageous location to embark in the business of manufacturing pig iron, with the knowledge that



favorable contracts for construction and equipment could be made and that the very reasonable certainty existed that the depression could not continue indefinitely.

It is an easy matter to look back upon the occurrences of 1906 and 1907 and condemn severely those who at that time decided to increase largely their productive capacity for the purpose of enabling them to meet the expanding requirements of their trade. This experience was shared both by the United State Steel Corporation and by the independent manufacturers. It can easily be assumed now that every manufacturer should have known that the extraordinary demand could not continue and that like a flood it would speedily run itself out. But it then seemed to be necessary for every manufacturer who found himself unable to supply his customers promptly to do what he could to relieve the situation. The great expansion which occurred in 1909 and 1910 was the direct result of the improvements which were decided upon or which were undertaken in that period of exuberant trade and unbounded confidence. The engagements made at that time had to be carried out. Even though the recession in trade proved more serious than any one expected, the contracts had to be completed. It may be said further that the strong though brief revival in 1909 seemed to vindicate the sagacity of those who had undertaken the extensive improvements. It must even be admitted that for a time the appearances were strongly in favor of the demand rising to a sufficient height to absorb the entire output of the increased capacity of furnaces and mills.

The strictures of the article in question are too severe, if not wholly unwarranted. The Gary policy of cooperation is by no means to be blamed for all that has happened in the expansion of our productive capacity. If the steel manufacturers had decided in 1907 that no new construction should be undertaken, or if any set of manufacturers had decided to make conditions so unsatisfactory that no one of their number or any outside interests could see any inducement for their enlarging old works or building new ones, it may well be imagined that within a comparatively brief period thereafter the time would have come when the production of this country would have been totally inadequate to supply the demand for iron and steel. That would have been a more serious economic mistake for the country than the present condition of the iron and steel industry. The time will surely come, and possibly it may not be far distant, when the country will need every pound of iron and steel which its furnaces and mills can turn out. When that day comes consumers will have reason for thankfulness that the expansion of the industry was not completely checked in the period extending from 1908 to 1911.

### The Two Influences in Machinery Buying

Machinery builders and dealers, in their complaints regarding "zig-zagging" or "sweating the bidders," make a sharp distinction between the professional purchasing agent and the shop man. In the natural order of things the decision of the former as to equipment is largely governed by price. Just as naturally, the decision of the superintendent or works manager, or any other man who has an intimate knowledge of manufacturing details, would be expected to be governed by merit or a special adaptation of some one machine to the work which is to be done. It often happens that two machines of absolutely equal excellence of design

and construction differ in some essential feature, so that one would likely be chosen for a certain work in preference to the other. More often still, a decided difference exists between machines in that one is better than the other, and for that reason more expensive. Even when the two machines stand upon an equal basis, the prices are usually different.

The shop manager or superintendent is expected to fight hard to get the best machine for the purpose. His duty is to procure a required standard of product at the minimum of cost, and much of his success must depend upon the wise selection of his equipment. The initial cost of machinery is each year becoming a less conspicuous consideration in buying. Therefore, salesmen who have to deal with the shop official resent his putting aside every element in a transaction except that of money. They argue that he is not doing his duty by his company, nor is he weighing in the balance the several elements which should enter into his decision. The machinery salesman and the purchasing agent are natural antagonists—usually friendly, but nevertheless antagonists. The latter stands between the salesman or the machinery house on the one hand and the shop on the other. Naturally then, when the shop man joins forces with the purchasing agent, with the one end in view of forcing down prices, the machinery people can see no consistency in his position.

In a communication printed in last week's issue of *The Iron Age*, the strong point is made that machinery houses should not put themselves in a position where they can be beaten down; they should make one price, which they could not be induced to shade under any stress of keen competition. This is theoretically true, and a large percentage of the manufacturers of machine tools adhere to the rule. But dealers cannot always afford to live up to a price list. Business reasons may make it an impossibility to do so, probably just as business reasons may make it impossible for many of the employers of purchasing agents and others having authority in the buying of machinery to maintain prices on their own products at all times in a dull market.

### Open-Hearth Furnace Capacities

The absence of any standard practice in stating the capacities of open-hearth steel furnaces is noteworthy. It is really remarkable that trade custom has not reduced the nomenclature of the industry to a basis permitting of a reasonably close estimate of the monthly output of ingots which may be expected from a plant containing a number of furnaces of a stated size. One hears very frequently of "50-ton furnaces" and "60-ton furnaces," also of "50 to 60-ton furnaces," but one's respect for the phrase as a vehicle of information is greatly reduced by the knowledge that a so-called 50-ton furnace may be found to be producing 85 tons at a heat, while a 60-ton furnace may be producing 75 tons.

Nothing can be simpler, of course, than to compute the capacity, in tons of steel, of the geometrical figure offered by the open hearth. The fault does not lie there. In the case of a blast furnace the conditions are different. The cubical contents of the furnace, or even of the hearth, is but one factor in many, and the fact that the so-called "600-ton furnaces" of the late nineties did not really produce 600 tons of pig iron a day until many years afterward was no disgrace. It is difficult, however, to describe adequately the practice which frequently designates an open-hearth furnace as of 50 or 60 tons capacity and then makes it yield regularly 75 or 85 tons of steel ingots per heat.

To state the capacities of open-hearth furnaces at the actual number of tons of steel which they are expected to produce per heat would relieve the industry of a situation in which it confesses that frequently it says a certain number of tons when a totally different number of tons will result in practice. That, however, is about all it would do, for the reason that even when the average number of tons per heat is known the monthly production is not indicated. There is a wide range in the number of heats produced per week. Four general factors, or groups of factors, enter: (1) Whether or not direct blast furnace metal is used; (2) the quantity and physical condition of scrap used; (3) the analysis of the pig, particularly as to phosphorus; (4) the works management, esprit de corps, etc.

To an extent, it may be observed, the design and construction of the furnace are made to conform to some of the above factors. The proportions of ore, pig and scrap to be used have an influence in fixing the contour of the hearth, while of course the question of direct or cold pig is important. Thus when the actual capacity of the furnace, or rather the quantity of steel produced at a heat, is known, the weekly or monthly capacity cannot be figured except by the use of considerable additional information.

The entrance of these other factors into the problem of the actual capacity per week or month of an open-hearth furnace does not make it unnecessary that the carrying capacity of the furnace itself should be stated, with some approach to accuracy. Rather it makes it the more incumbent upon those who deal with these premises, unless they desire to withhold rather than to give information, to state the actual furnace capacities. Otherwise the industry is putting itself in a position in which it confesses that it does not, even for its own use, wish to develop a system of indicating the potency of its tools. Obviously it is out of the question to develop a system which would express capacities in terms of total product per week or month. That would be the product of tons per heat by the number of heats. The latter factor can only be estimated, and may vary according to conditions. The former can be computed from the form and design of the furnace. If a furnace can reasonably be expected to make 75 or 85 tons per heat, there is no sense in persisting in calling it a 50-ton or a 60-ton furnace.

### Drafting Room Expense

A manufacturer remarked recently that, in his judgment, one of the largest items of unnecessary expense is to be found in the quantity of detail work done in the drafting room of the average machinery building concern. Hours are spent in the preparation of elaborate drawings which are intended solely for use in the pattern-making department and foundry, machine and assembling shops; whereas, with skilled workmen only the roughest kind of sketches are necessary, if they are so made as to be clearly blueprinted and have all of the dimensions accurately shown. His policy is to treat the foremen and skilled workers of his plant in such a manner that they are content to remain with him, year after year. The wages paid are more than they can obtain elsewhere for the same line of work, and if business is slack they are carried along just the same. This means considerable extra outlay, but he figures that through their close acquaintance with the details of his operations and the skill which they have acquired in them he is able to eliminate a large percentage of the

expenses usually incident to such an establishment. He states, also, that by having the men work from comparatively rough drawings they are taught to use their heads, with the result that numerous suggestions for improvements in designs, choice of materials, shop methods, etc., come to him each week without any bonus system or other inducement.

## Correspondence

### A Remarkable Boiler Performance

*To the Editor:* We note with considerable interest an article in your issue of May 25 showing results of boiler tests made by William O. Webber, of Boston, Mass. As the efficiencies obtained in these tests are so exceptionally high, we would like to obtain further information.

We would like to know what methods were used in weighing the feed water, the coal and the ash. How often samples of coal were taken from which the moisture content was determined, also an analysis of the coals used, if such is obtainable, showing fixed carbon, sulphur and volatile matter.

The highest rate of evaporation, and consequently efficiency, was shown in the test during which the coal having the lowest calorific value and highest moisture content and percentage of ash, was used. This is rather remarkable and if possible we would appreciate it if Mr. Webber could make some explanation.

Further, if Mr. Webber has any drawings showing the arrangement of the boiler setting for the boilers tested we would appreciate it if you could publish it.

We also note that the percentage of moisture in the steam is rather high and would therefore like to know at what point the calorimeter readings were taken and what type of calorimeter was used in determining this moisture content.

C. F. MOORE,

Chief Engineer, United States Smelting, Refining & Mining Company.

SALT LAKE CITY, UTAH, May 31, 1911.

*To the Editor:* Replying to the letter from C. F. Moore would answer as follows:

The water of evaporation used was measured by a Worthington hot water meter, calibrated to pressure and heat by actual tests made by actual weights on a Fairbanks' scale. The coal and the ashes were weighed by Fairbanks' standard scales every 6 hr. The moisture in the coal was determined every few days. The coal was analyzed every few days and is fully shown in the tests in detail.

The only explanation I can make why the coal having the lowest calorific value and the highest moisture gave such good results as it did is that it was the clearest and cleanest burning coal, and the openings of the grate, I suppose, just suited that particular texture of coal.

There is no question at all of the accuracy of the tests made, as they were carried on for too long a time to fake the results. In other words, a 60-hr. test is too long to allow many errors, and three sets of observers took the readings once every hour at least.

I have no drawing showing the arrangement of the boiler setting for the boilers tested, but they were good, ordinary return tubular boilers, set in the ordinary manner, without any particular furnace arrangement and the cracks in the boiler setting had been all carefully plastered up and put in good shape so that there was no leak of outside air. Every precaution was taken to make the brick work and the connection perfectly tight and reliable.

The percentage of moisture in the steam was determined at a point just above the boilers in the main steam pipe, and was taken continuously and the amount determined every half hour by the calorimeter, the Carpenter calorimeter being used.

The water meter reading was taken at the end of every hour, the coal and ashes weighed at the end of every 6 hr., the feed water temperature once an hour, steam pressure once an hour, the pyrometer, damper, draft gauge barometer temperature of air, etc., all taken once an hour. The tests of the different kinds of coal were all made by



exactly the same apparatus without any change whatever, and, as stated, the readings were made by three sets of observers, checked by the personal readings of the writer for 8 hr. a day.

WM. O. WEBBER,  
Consulting Engineer

Boston, Mass., June 10, 1911.

### Coke Oven Gas in Open Hearth Furnaces

To the Editor: In the issue of *The Iron Age* of May 18, page 1232, I have noted with interest an abstract by "G. B. W." of a German review of M. Trasenster's article on the use of coke oven gas in open hearth furnaces. The concluding sentence in this abstract reads as follows: "The results, therefore, notwithstanding the good thermal efficiency obtained in this case, are not altogether favorable." This thought is nowhere expressed in M. Trasenster's article which is under discussion, and has undoubtedly crept in through the double translation. I note that the review in *Stahl und Eisen* is less favorable to coke oven gas than M. Trasenster's article, while *The Iron Age* has, in this respect, still further departed from the original.

In the original article, which was published in the *Revue Universelle des Mines* in November, 1910, the paragraph in question appears substantially as follows: "Notwithstanding the favorable appearances, we will not risk prophesying a better efficiency in the heating of the steel bath by coke oven gas (meaning here the actual transfer of heat from burning gas to the melting metal), but we can at least depend on having equally favorable conditions in this regard, and consequently, as we have shown above, we can register an improvement of thermal efficiency from operating a furnace with coke oven gas when the air only traverses the regenerators, as compared with the same furnace operating on producer gas, and with both the air and gas preheated."

You will note that this gives a clear advantage for the use of coke oven gas, and in justice to the further development of American open hearth practice it seems important to correct the unfavorable inference in the abstract in *The Iron Age* of May 18. C. G. TUFTS.

SYRACUSE, N. Y., June 6, 1911.

### Direct Current of 1500 Volts for a Railroad

Among other large orders received by the Westinghouse Electric & Mfg. Company in May, particular importance is attached to contracts for the electrification of two sections of road of the Piedmont Traction Company in North Carolina and South Carolina, on account of the fact that this is the first railroad electrification in America to be equipped with apparatus for 1500 volts direct current. One section, 35 miles, extends from King's Mountain to Charlotte, N. C., and the other, 95 miles, extends from Greenwood to Spartanburg, S. C., with a 10-mile spur from Belton to Anderson. The average modern direct-current railroad uses current of a maximum of 550 to 650 volts. Considerations of economy in transmission have led to the increase of direct-current voltage in railroad work and a number of lines are now operated on 1200 volts, but the Piedmont Traction system is the first one to contract for 1500-volt equipment, and the Westinghouse Electric & Mfg. Company thus becomes the first in this field. The power for both of the electrified lines will be purchased from the transmission lines of the Southern Power Company and fed to the line through motor-generator sets in substations.

Schimer, McGlynn & Co., Inc., Nineteenth street and Washington avenue, Philadelphia, Pa., expect to put their plant for rolling phosphor bronze, German silver and Monel metal sheets, rods and wire in operation about July 1. They will make a specialty of planished Monel sheets. H. M. Schimer is president; Wm. P. McGlynn, vice-president and general manager, and C. E. L. Hatch, secretary and treasurer.

Edgar Allen & Co., Ltd., tool steel manufacturers, 434 West Randolph street, Chicago, have opened an Eastern branch office and warehouse in Boston, Mass., located at 71 Kilby Street. It will be under the management of Harry B. Eaton, formerly of the Simplex Tool & Supply Company.

### The Brussels International Conference

A considerable number of the steel manufacturers of this country have either sailed for Europe or will leave some time this month to meet steel manufacturers from other countries in the international conference to be held at Brussels, Belgium, July 5 and 6. For five days, beginning June 26, the American steel manufacturers will be the guests of iron and steel manufacturers of Great Britain. It is the hope of those who have arranged this conference that a better understanding may be brought about between the steel manufacturers of this country and Europe, although it will of course be out of the question to attempt to make any agreement as to the prices of steel products in the markets of the world or anything like a division of territory. Interest naturally centers on the impression which Chairman E. H. Gary, of the United States Steel Corporation, will be able to make upon the steel manufacturers of other countries. Judge Gary's policy of co-operation has been warmly and almost unanimously supported by American steel manufacturers and the world will look with keen attention for the result of his efforts to win adherents to it from the European manufacturers who will attend this conference.

**The Philadelphia Foundry Foremen.**—The Associated Foundry Foremen of Philadelphia and Vicinity held their regular monthly meeting at the Manufacturers' Club, Philadelphia, on the evening of June 13, vice-president James Whitehead in the chair. A new constitution and new by-laws were adopted, which provide for the adoption of a new name, The Associated Foundry Foremen of Philadelphia, also for the elimination of the associate class of membership, the article on membership providing a wider scope of eligibility and the admission of those previously classed as associate members to active membership. The office of treasurer was eliminated and provision made for the election of a secretary-treasurer, who will perform the duties of both officers. Dues were fixed at \$4 per year. Howard L. Warner, representing Frank Samuel, Philadelphia, was elected to membership. Adjournment was taken until September 12, no meetings being held during the summer months.

Governor Marshall of Indiana has named the Commission of Industrial Education created by the last State Legislature. State Senator W. A. Yarling, of Shelbyville, Ind., is chairman, and John A. Lapp, legislative reference librarian, Indianapolis, is secretary. John L. Ketcham, secretary-treasurer of the Brown-Ketcham Iron Works, Indianapolis, is a member of the committee, as is also Frank Duffy, secretary of the United Brotherhood of Carpenters and Joiners of America. The other members are John G. Brown, Monon, a member of the Legislature; T. F. Fitzgibbon, Columbus; F. D. McElroy, Hammond, and Prof. U. G. Weatherly, of Indiana University, Bloomington. The law provides that the commission shall investigate the need of education in the various industrial pursuits and recommend the forms of educational effort that may be employed.

The Indiana Steel Company, Gary, Ind., on Thursday, June 15, made a test of its new sheet bar mill. The trial was limited to the turning over of the motor and machinery, and no steel was run through. This mill adjoins the billet mill and is driven by a 6000 hp. motor, which is a duplicate of the rail and billet mill drivers. The beginning of permanent rolling will depend largely on the market demand for the output of the Gary sheet mills of the American Sheet & Tin Plate Company, which are already in partial operation.

The Laclede Steel Company, St. Louis, Mo., the particulars of whose organization were given in *The Iron Age* of April 6, has bought a site on the east side of the Mississippi River, between Madison and East St. Louis, Ill., and will at once proceed with the construction of a rolling mill for the purpose of rerolling old steel rails into merchantable shapes. Thomas R. Akin is president, and William E. Guy is heavily interested.

The Farris Engineering Company has removed its offices from the Diamond National Bank Building to 8043 Jenkins Arcade Building, Pittsburgh, Pa.

# The Iron and Metal Markets

## A Comparison of Prices

### Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	June 21 1911.	June 14 1911.	May 24 1911.	June 22 1910.
<b>PIG IRON, Per Gross Ton:</b>				
Foundry No. 2, standard, Philadelphia	\$13.25	\$15.25	\$15.50	\$16.50
Foundry No. 2, Valley furnace	13.50	13.50	13.75	14.50
Foundry No. 2, Southern, Cincinnati	13.25	13.50	13.75	14.75
Foundry No. 2, Birmingham, Ala.	10.00	10.25	10.50	11.50
Foundry No. 2 local, at furnace, Chicago*	15.00	15.00	15.00	16.75
Basic, delivered, eastern Pa.	14.50	14.50	14.50	16.00
Basic, Valley furnace	13.00	13.10	13.25	14.50
Bessemer, Pittsburgh	15.90	15.90	15.90	16.40
Gray forge, Pittsburgh	13.90	13.90	14.15	14.90
Lake Superior charcoal, Chicago	16.50	17.00	17.00	18.50

### COKE, CONNELLSVILLE,

Per Net Ton, at oven:

Furnace coke, prompt shipment	1.40	1.40	1.45	1.65
Furnace coke, future delivery	1.60	1.60	1.75	1.80
Foundry coke, prompt shipment	1.75	1.75	1.75	2.15
Foundry coke, future delivery	2.05	2.05	2.00	2.30

### BILLETS, &c., Per Gross Ton:

Bessemer billets, Pittsburgh	21.00	21.00	23.00	25.00
Forging billets, Pittsburgh	26.00	26.00	28.00	31.00
Open hearth billets, Philadelphia	23.40	23.40	25.40	28.50
Wire rods, Pittsburgh	21.00	29.00	29.00	31.00

### OLD MATERIAL, Per Gross Ton:

Iron rails, Chicago	14.00	14.00	14.50	17.00
Iron rails, Philadelphia	16.50	16.50	16.75	19.50
Car wheels, Chicago	12.50	12.50	12.75	15.50
Car wheels, Philadelphia	13.00	13.00	13.00	15.00
Heavy steel scrap, Pittsburgh	13.00	12.75	13.00	15.00
Heavy steel scrap, Chicago	10.25	10.25	10.25	13.00
Heavy steel scrap, Philadelphia	13.00	13.00	13.00	14.50

### FINISHED IRON AND STEEL,

Per Pound:

	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	1.27 1/2	1.27 1/2	1.27	1.47 1/2
Common iron bars, Pittsburgh	1.25	1.25	1.30	1.50
Common iron bars, Chicago	1.20	1.20	1.22	1.45
Steel bars, Pittsburgh	1.25	1.25	1.40	1.45
Steel bars, tidewater, New York	1.41	1.41	1.56	1.61
Tank plates, Pittsburgh	1.35	1.35	1.40	1.45
Tank plates, tidewater, New York	1.51	1.51	1.56	1.61
Beams, Pittsburgh	1.35	1.35	1.40	1.45
Beams, tidewater, New York	1.51	1.51	1.56	1.61
Angles, Pittsburgh	1.35	1.35	1.40	1.45
Angles, tidewater, New York	1.51	1.51	1.56	1.61
Skelp, grooved steel, Pittsburgh	1.25	1.30	1.30	1.50
Skelp, sheared steel, Pittsburgh	1.35	1.35	1.35	1.60

### SHEETS, NAILS AND WIRE,

Per Pound:

	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.00	2.00	2.20	2.40
Wire nails, Pittsburgh	1.70	1.80	1.80	1.80
Cut nails, Pittsburgh	1.60	1.60	1.80	1.75
Barb wire, galv., Pittsburgh	2.00	2.10	2.10	2.10

### METALS,

Per Pound:

	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.75	12.75	12.37 1/2	12.75
Electrolytic copper, New York	12.50	12.50	12.12 1/2	12.50
Spelter, St. Louis	5.55	5.32 1/2	5.20	5.00
Spelter, New York	5.75	5.55	5.50	5.15
Lead, St. Louis	4.35	4.30	4.22 1/2	4.22 1/2
Lead, New York	4.50	4.45	4.27 1/2	4.37 1/2
Tin, New York	44.87 1/2	46.87 1/2	44.60	32.60
Antimony, Hallett, New York	8.75	8.75	9.00	8.12 1/2
Tin plate, 100-lb. box, New York	3.94	3.94	3.94	3.84

### Prices of Finished Iron and Steel f.o.b.

#### Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22 1/2c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

**Structural Material.**—I-beams and channels, 3 to 15 in., inclusive, 1.35c. to 1.40c., net; I-beams over 15 in., 1.45c. to 1.50c., net; H-beams over 8 in., 1.50c. to 1.55c.; angles, 3 to 6 in., inclusive, 1/4 in. and up, 1.35c. to 1.40c., net; angles over 6 in., 1.45c. to 1.50c., net; angles,

3 in. on one or both legs, less than 1/4 in. thick, 1.40c., plus full extras as per steel bar card effective September 1, 1909; tees, 3 in. and up, 1.40c., net; zees, 3 in. and up, 1.35c. to 1.40c., net; angles, channels and tees under 3 in., 1.40c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.65c. to 1.70c., net; hand rail tees, 2.45c.; checkered and corrugated plates, 2.45c., net.

**Plates.**—Tank plates, 1/4 in. thick, 6 1/4 in. up to 100 in. wide, 1.35c. to 1.40c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, 1/4 in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered 3/4-in. plates. Plates over 72 in. wide must be ordered 1/4-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under 1/4-in. to and including 3-16-in. on thinnest edge, extra	\$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft. inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over. TERMS—Net cash 30 days.

**Sheets.**—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, U. S. standard gauge, 1.40c.; Nos. 9 and 10, 1.50c.; Nos. 11 and 12, 1.55c.; Nos. 13 and 14, 1.60c.; Nos. 15 and 16, 1.70c. One pass, cold rolled, box annealed sheets, Nos. 10 to 12, 1.65c.; Nos. 13 and 14, 1.70c.; Nos. 15 and 16, 1.75c.; Nos. 17 to 21, 1.80c.; Nos. 22, 23 and 24, 1.85c.; Nos. 25 and 26, 1.90c.; No. 27, 1.95c.; No. 28, 2c.; No. 29, 2.05c.; No. 30, 2.15c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 1.85c.; Nos. 17 to 21, 1.90c.; Nos. 22 to 24, 1.95c.; Nos. 25 and 26, 2c.; No. 27, 2.05c.; No. 28, 2.10c.; No. 29, 2.15c.; No. 30, 2.25c. Galvanized sheets, Nos. 10 and 11, black sheet gauge, 2c.; Nos. 12, 13 and 14, 2.10c.; Nos. 15, 16 and 17, 2.25c.; Nos. 18 to 22, 2.40c.; Nos. 23 and 24, 2.50c.; Nos. 25 and 26, 2.70c.; No. 27, 2.85c.; No. 28, 3c.; No. 29, 3.10c.; No. 30, 3.30c. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2 1/2-in. corrugations:

Gauge.	Painted	Galvanized.	Gauge.	Painted	Galvanized.
29	.....	\$2.40	23	\$2.40	\$3.50
28	\$1.40	2.55	22	2.60	3.70
27	1.55	2.60	21	2.80	4.05
26	1.65	2.65	20	3.05	4.35
25	1.85	3.05	18	4.05	5.70
24	2.10	3.15	16	4.90	6.50

**Wrought Pipe.**—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1:

	Butt Weld.		Iron	
	Black.	Galv.	Black.	Galv.
1 to 1 1/2 in.	75	63	49	43
1 1/2 in.	75	63	71	59
3/4 to 1 1/2 in.	79	69	75	65
2 to 3 in.	80	70	76	66
Lap Weld.				
2 in.	76	66	72	62
2 1/2 to 4 in.	78	67	74	64
4 1/2 to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	15 1/2	..	..	..
Butt Weld, extra strong, plain ends, card weight.				
1/2, 3/4, 1 in.	69	59	65	55
1 1/2 in.	74	68	70	64
3/4 to 1 1/2 in.	78	72	74	68
2 to 3 in.	79	73	75	69



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Lap Weld, extra strong, plain ends, card weight.			
2 in.....	75	69	71
2½ to 4 in.....	77	71	73
4½ to 6 in.....	76	70	72
7 to 8 in.....	69	59	65
9 to 12 in.....	64	54	60
Butt Weld, double extra strong, plain ends, card weight.			
¼ in.....	64	58	60
¾ to 1½ in.....	67	61	63
2 to 3 in.....	69	63	65
Lap Weld, double extra strong, plain ends, card weight.			
2 in.....	65	59	61
2½ to 4 in.....	67	61	63
4½ to 6 in.....	66	60	62
7 to 8 in.....	59	49	55

Plugged and Reamed.  
1 to 1½, 2 to 3 in. Butt Weld { Will be sold at two (2) points lower basing (higher price) than merchants or card weight pipe. Butt or lap weld, as specified.  
2, 2½ to 4 in.....Lap Weld {  
The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

**Boiler Tubes.**—Discounts on lap welded steel boiler tubes to jobbers in carloads are now as follows:

	Steel.
1¾ to 2¼ in.....	65
2½ in.....	67½
2¾ to 3¼ in.....	70
3½ to 4½ in.....	72½
5 to 6 in.....	65
7 to 13 in.....	62½

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points for lengths 22 feet and under; longer lengths f.o.b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

**Wire Rods and Wire.**—Bessemer, open hearth and chain rods, \$27. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, \$1.50, galvanized \$1.80; carload lots, to retailers, annealed \$1.55, galvanized \$1.85. Galvanized barb wire, to jobbers, \$2; painted, \$1.70. Wire nails, to jobbers, \$1.70.

The following table gives the prices to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

		Fence Wire, Per 100 Lb.						
No.		0 to 9	10	11	12 & 12½	13	14	15
Annealed	.....	\$1.65	1.70	1.75	1.80	1.90	2.00	2.10
Galvanized	.....	1.95	2.00	2.05	2.10	2.20	2.30	2.70
Market and Stone Wire in Bundles, Discount from Standard List.								
Bright and Annealed:								
9 and coarser	.....	.....	.....	.....	.....	.....	80	.....
10 to 18	.....	.....	.....	.....	.....	.....	80 and 10	2½
19 to 26	.....	.....	.....	.....	.....	.....	80 and 10	2½
27 to 36	.....	.....	.....	.....	.....	.....	80 and 10	5
Galvanized:								
9 and coarser	.....	.....	.....	.....	.....	.....	75 and 10	.....
10 to 16	.....	.....	.....	.....	.....	.....	75 and 10	.....
17 to 26	.....	.....	.....	.....	.....	.....	72½ and 10	.....
27 to 36	.....	.....	.....	.....	.....	.....	72½ and 10	72½
Coppered or Liquor Finished:								
9 and coarser	.....	.....	.....	.....	.....	.....	75 and 10	.....
10 to 26	.....	.....	.....	.....	.....	.....	75 and 10	.....
27 to 36	.....	.....	.....	.....	.....	.....	70 and 10	5
Tinned:								
6 to 18	.....	.....	.....	.....	.....	.....	75 and 10	10

## Pittsburgh

PARK BUILDING, June 21, 1911.—(By Telephone.)

**Pig Iron.**—Inquiry for pig iron is more active than at any time for some months. One buyer asks for 5,000 tons at basic for shipment over the last half of the year and other basic inquiries range from 500 to 2,000 tons. A radiator company at Johnstown, Pa., is asking for 3,000 tons of No. 2 foundry for last half, a local foundry for 1,000 tons, and another consumer for 500 tons. A large inquiry is pending for maleable Bessemer from a Western consumer. There is no demand for standard Bessemer, while stocks in the valleys are very heavy. Basic iron secured in exchange for scrap is still being offered at low prices, in some cases below \$13 at furnace, but most of the Valley furnaces are holding basic at \$13.25 at furnace. We quote as follows: Bessemer pig iron, nominally, \$15; maleable Bessemer, \$13.50; basic, \$13; No. 2 foundry, \$13.50 to \$13.75; gray forge, \$13, all at Valley furnace.

**Steel.**—Specifications against contracts for billets and sheet bars are better. The rail and billet sales department of the Carnegie Steel Company reports that actual orders for rails, billets and sheet bars sent to the mills for rolling, up to and including June 20, exceed the same period in May by 28,000 tons. We note a sale of 500 tons of 4 x 4-in. Bessemer billets, July delivery, at \$21, Pittsburgh, and a reported sale of 1,000 tons of Bessemer sheet bars, for July and August, at \$23, Pittsburgh. We quote Bessemer and open hearth billets, 4 x 4 in., and up to, but not including, 10 x 10 in., \$21, base, and sheet and tin bars in 30-ft. lengths, \$22; 1½-in. billets, \$22; forging billets, \$26, base, usual

extras for sizes and carbons—al prices, being f.o.b. Pittsburgh or Youngstown district, with freight to destination added.

(By Mail.)

The sales departments of a number of the larger steel interests report that in the past week specifications against contracts for material have been coming in a good deal more freely, while more new orders are being placed for some lines of material, notably steel rails, structural steel, plates and sheets. The wire, tin plate and pipe trades continue quiet, with only a fair amount of new business being placed. There is a decided feeling that from this time on there will be gradual improvement in the whole trade. The low prices ruling on pig iron, notably basic and foundry, have brought out some new inquiry and considerable tonnage is under negotiation. The steel billet and sheet bar trade is quiet, nearly all consumers being covered by contracts, but specifications so far this month have not been as heavy as during the same period in May. A conference between the independent sheet and tin plate mills and the Amalgamated Association is to be held in this city on Thursday, and it is expected that then the sheet and tin plate mill scales will be settled. A large inquiry is out for furnace coke for the last half of the year, which will probably test prices. There is an active inquiry for heavy steel scrap, boring and turnings, with prices ruling a little firmer. The whole situation is more encouraging and there is a more optimistic feeling as regards the future than at any time for some months.

**Ferromanganese.**—There is a fair amount of new inquiry and we note a sale of about 250 tons to a Western steel interest and about 75 tons to a local interest on the basis of \$36.50 Baltimore. We quote foreign 80 per cent. at \$36.50 to \$36.75 f.o.b. Baltimore, with a freight rate of \$1.95 a ton for delivery in the Pittsburgh district.

**Ferrosilicon.**—New inquiry is very light, most consumers being covered ahead for some time, while prices on 50 per cent. ferrosilicon are ruling lower now than at any time for some months. We quote 50 per cent. at \$51.50 to \$52, Pittsburgh, for delivery over second half of the year; 10 per cent. blast furnace silicon, \$22; 11 per cent., \$24, and 12 per cent., \$25, f.o.b. cars Ashland and Jisco furnaces.

**Muck Bar.**—There have been no recent sales and there is no new inquiry. We quote best grades of muck bar made from all pig iron at nominally \$28.50 Pittsburgh.

**Skelp.**—A local consumer has bought about 1,000 tons of wide sheared iron plates on the basis of 1.75c., delivered at his mill, Pittsburgh district. Prices on steel skelp are slightly lower. We quote grooved steel skelp at 1.25c.; sheared steel skelp, 1.35c.; grooved iron skelp, 1.50c. to 1.50c., and sheared iron skelp, 1.70c. to 1.75c., usual terms, all for delivery at consumers' mills in the Pittsburgh district.

**Wire Rods.**—A sale of 300 tons of Bessemer wire rods for July and August delivery is reported to have been made last week on the basis of \$29, Pittsburgh, but prices have now been reduced to \$27, at which we quote Bessemer, open hearth and chain rods at Pittsburgh.

**Structural Material.**—New inquiries have been made active and considerable work has been placed. A tremendous amount of work is coming up in New York City and vicinity and also in the Chicago district, and it is probable that a good deal of the tonnage to be placed will be rolled by local mills. The Jones & Laughlin Steel Company has taken 1,000 tons for the Fire Association building in Philadelphia. The McClintic-Marshall Construction Company has taken 2800 tons for a new warehouse for Larkin & Co., Buffalo, N. Y., and 1,500 tons of bridge work for the Atlantic Coast Line. The Farris Bridge Company, of this city, is making plans for a new bridge in Clinton County, Pa., which will require about 500 tons of steel, and the Riverside Bridge Company, Martins Ferry, Ohio, has taken contracts for new buildings for the Wheeling Electric Company and the Wheeling Can Company, Wheeling, W. Va., about 500 tons. Competition among the fabricating interests continues very keen and some low prices on fabricated work are still being made. We continue to quote beams and channels up to 15 in. at 1.35c., Pittsburgh.

**Plates.**—Actual car orders placed in the past week have been light, but some fairly large inquiries are out. The Canadian Car & Foundry Company, Montreal, Can., has taken 1,000 box cars with steel underframes for the Grand Trunk. The Baltimore & Ohio, the Queen & Crescent and the Louisville & Nashville are

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reported as in the market with inquiries for 1000 steel cars each, and one or two other roads are said to be about ready to send out inquiries for a large number of cars. The plates, about 4200 tons, for the Los Angeles, Cal., aqueduct, contract for which was taken last week by the Treadwell Construction Company, have not yet been placed, and the gas holder for the Philadelphia company, about 6000 tons, is still being held up. Nothing has been heard recently of the two new projected hotels in this city, but these are expected to come out before long. We quote  $\frac{1}{4}$ -in. and heavier plates at 1.35c., Pittsburgh.

**Sheets.**—The improvement in new demand and in specifications for sheets, noted in this report last week, still continues and the American Sheet & Tin Plate Company and some of the independent sheet mills report they are booking quite a large volume of new business, while specifications against contracts are more active than for several months. The lower prices on sheets which went into effect on June 1 are reported as being well maintained, being shaded only to slight extent and in a few cases. Reports that the American Sheet & Tin Plate Company had started up its works at Sharon, Pa., which contains five hot mills, are untrue. This plant has been closed for more than a year and will probably not be started again, as it is likely that the equipment will be moved at some time to some other plant. We give the full schedule of prices on black and galvanized and on roofing sheets on a previous page.

**Tin Plate.**—There is very little new buying of tin plate, as this is the dull season, but specifications against contracts continue to come in very freely and shipments by the mills this month promise to be heavier than in May. The American Sheet & Tin Plate Company has started four more hot mills in its Laughlin Works at Martins Ferry, Ohio, and now has 20 of the 23 hot tin mills in this plant in operation. Prices are firm, and we quote 100-lb. cokes, 14 x 20, at \$3.70 per box f.o.b. Pittsburgh.

**Bars.**—Leading makers of steel bars report they are booking a fairly large volume of new business on contracts on the 1.25c. basis, some of these contracts running up to October 1 only, while others run as far ahead as January 1 or later. It is stated that shortly after the recent reduction in prices was made on steel bars there was some tonnage sold at 1.20c., but it is claimed this was for prompt shipment, and that on all contracts for extended delivery, 1.25c. is being paid. As yet no settlement of the puddling and bar iron scales has been made with the Amalgamated Association, and as the Republic Iron & Steel Company has no agreement with this organization for continuous operation it is probable that some of its mills will close June 30 for inventory and repairs, and to wait for the wage scales to be adjusted. The new demand for iron bars is fair, but is referred to as a little heavier than for some time. We quote steel bars at 1.25c. and common iron bars at 1.25c. to 1.30c. f.o.b. Pittsburgh.

**Shafting.**—The new demand for shafting is only for small lots to cover current needs. Specifications against contracts are not satisfactory to the makers, especially from the large users who are taking in as little material as they possibly can. Regular discounts on shafting remain at 60 per cent. off in carload and larger lots and 55 per cent. in less than carloads delivered in base territory, but in exceptional cases these discounts are slightly shaded.

**Spelter.**—There has been a decided improvement in the spelter market, the new demand being much heavier, while prices have shown a sharp advance. On Saturday spelter sold at 5.50c., East St. Louis, and is reported to have sold at 5.55c. this week. These prices show an advance of \$5 a ton within a week. We quote prime grades of Western at 5.50c. to 5.55c. East St. Louis, equal to 5.62½c. and 5.67½c. f.o.b. Pittsburgh.

**Hoops and Bands.**—The new demand continues quiet and specifications against contracts are only fair. The Sharon Steel Hoop Company has about completed the building of a new mill at Sharon, Pa., for the rolling of wide bands, which will be started shortly. We quote hoops at 1.40c. and bands at 1.50c., with extras on the latter as per the steel bar card.

**Merchant Steel.**—Specifications from jobbers and consumers continue unsatisfactory, while the new demand is only for small lots to cover actual needs. Makers' prices, which however, are being shaded, are as follows: Iron finished tire,  $\frac{1}{2}$  x  $1\frac{1}{2}$  in. and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.90c.; flar sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter

shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

**Rivets.**—The inquiry for rivets is heavier than for some time, and there is also an increase in actual business. Jobbers and consumers believe that prices on rivets have probably touched bottom, and are buying more freely than for some time. We quote structural rivets at 1.75c., and boiler rivets at 1.80c., these prices being better observed than for several months.

**Wire Products.**—The demand continues light, and this is also true of specifications, which have been unsatisfactory to the mills for some time. In fact, jobbers and retailers of wire and wire nails are taking in as little material as possible, not being satisfied that present prices will be maintained. The season trade in wire nails and wire is over and the situation will likely be quiet until about September 1, when fall trade is expected to open up and new demand will likely show considerable increase. Prices have been reduced, and we now quote galvanized barb wire at \$2; painted, \$1.70; annealed fence wire, \$1.50; galvanized, \$1.80; wire nails, \$1.70, and cut nails, \$1.60, f.o.b. Pittsburgh, full freight to destination added.

**Spikes.**—Inquiries for spikes in the past week have been more active, partly due to concessions in prices, which are being more freely made than for some time. One local maker reports having entered an order for 3000 kegs, while inquiries are in the market from two railroads, one for 2500 kegs and the other for 2000 kegs. We quote railroad spikes at \$1.50 to \$1.55, base, per keg, f.o.b. Pittsburgh, with the usual extras for odd sizes.

**Merchant Pipe.**—The volume of business in merchant pipe so far this month is about the same as in the same period in May, but no large gas or oil lines have been placed for some little time. Three or four large projects are being talked of, but have not reached the stage where the inquiries have been sent out to the mills for the pipe. It is believed that the pipe trade will continue in about its present condition until about September 1, at which time a material betterment in demand is expected. Discounts on iron and steel pipe are given on a previous page.

**Iron and Steel Scrap.**—There is a stronger tone to the scrap market and a number of dealers who have been selling short for some time are now covering their short sales, having bought a good deal of material in the past two weeks. Several leading consumers are disposed to take in scrap after July 1 at present prices, but as a rule dealers are refusing to sell for such delivery at to-day's market, believing that very early in July, if not before, prices will be better than they are now. A good deal of scrap offered by the Baltimore & Ohio Railroad was bought direct by consumers, part of its heavy iron and steel scrap being reported as having been sold for delivery at Monessen, Pa., at \$13 or better. Much of the Pennsylvania Railroad scrap also went to consumers by direct sales. There is a good deal of inquiry for heavy steel scrap, cast iron borings and machine shop turnings, prices on which are firm. Dealers expect a very active demand for scrap after July 1, when consumers have taken inventory and made repairs. Dealers are now quoting per gross ton, f.o.b. Pittsburgh, as follows:

Heavy steel scrap Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery.	\$13.00 to \$13.25
No. 1 foundry cast.....	13.25 to 13.50
No. 2 foundry cast.....	12.75 to 13.00
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district.....	10.75 to 11.00
Re-rolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	13.50 to 13.75
No. 1 railroad malleable stock.....	12.00 to 12.25
Grate bars.....	10.50 to 10.75
Low phosphorus melting stock.....	16.00 to 16.25
Iron car axles.....	23.75 to 24.00
Steel car axles.....	18.50 to 18.75
Locomotive axles.....	23.00
No. 1 busheling scrap.....	12.00 to 12.25
No. 2 busheling scrap.....	8.50 to 8.75
Old car wheels.....	13.50 to 13.75
Sheet bar crop ends.....	15.50 to 15.75
*Cast iron borings.....	8.75 to 9.00
*Machine shop turnings.....	9.00 to 9.25
Old iron rails.....	15.00 to 15.25
No. 1 wrought scrap.....	14.25 to 14.50
Heavy steel axle turnings.....	10.00 to 10.25
Stove plate.....	10.50 to 10.75

\*These prices are f.o.b. cars at consumers' mill in the Pittsburgh district.

**Boiler Tubes.**—There is practically no new business being placed in boiler tubes, while contracts have been pretty well cleaned up. Consumers have no complaint to make about prices, but simply have not the business to place and are not carrying any more tubes in stocks than they can avoid.



# THE IRON AND METAL MARKETS

**Coke.**—The largest inquiry for furnace coke in the market is that of the Reading Iron Company, Reading, Pa., which is inquiring for 15,000 to 18,000 tons per month over the last half of the year. The inquiries of the American Steel Foundries and the American Locomotive Company for foundry coke for the last half have not yet been closed. Stocks are steadily decreasing, the output of the upper and lower Connells-ville regions last week having been 266,646 net tons, a decrease over the previous week of about 3000 tons. Some low prices continue to be made on furnace and foundry coke for prompt delivery. We quote standard grade furnace coke for spot shipment at \$1.40 to \$1.45, and for delivery over last half of the year at \$1.60 to \$1.70 per net ton at oven.

## Chicago

FISHER BUILDING, CHICAGO, June 21, 1911.—(By Telegraph.)

Sufficient improvement has been felt in the iron and steel trade as to bring out favorable reports from many quarters, while it is still equally possible to find those to whom the look is anything but encouraging. Specifications for rails totaling 25,000 tons and an increased volume of structural and steel plate bookings have sustained during the past week the hopeful attitude in finished steel lines. It now develops also that a larger proportion of the Western steel bar business has been closed than has been intimated up to this time. The only apparent unrest with regard to prices is limited to a slight weakness in steel plates and to that induced by competitive re-rolled steel and bar iron used by wagon makers.

**Pig Iron.**—The sale of about 7000 tons by one Southern interest has brought into this market a \$10, Birmingham price for No. 2 Southern iron, and it is now possible to buy moderate tonnages of such iron for prompt shipment on this basis openly. For last half shipment an advance of 25c. or possibly 50c. might be asked. Northern furnaces, both at Chicago and Milwaukee, are asking \$15 at the furnace, which restricts each furnace to its minimum freight area in setting strictly competitive iron in order to maintain this price. The miscellaneous orders of the week seem to have totaled a more satisfactory tonnage, and as a result a more optimistic tone prevails. An unusual spread between the prices of various Lake Superior charcoal irons has developed in this market. Certain lower Michigan peninsula brands can be bought at \$16.50, Chicago, but the greater number of irons bring \$17, delivered, while a northern Wisconsin furnace is holding at a \$17.50, delivered, price. The following quotations are for Chicago delivery, with the exception of Northern irons, which are quoted f.o.b. furnace:

Lake Superior charcoal.....	\$16.50 to \$17.00
Northern coke foundry, No. 1.....	15.50
Northern coke foundry, No. 2.....	15.00
Northern coke foundry, No. 3.....	14.75
Northern Scotch, No. 1.....	16.00
Southern coke, No. 1 foundry and No. 1 soft	14.85 to 15.10
Southern coke, No. 2 foundry and No. 2 soft	14.35 to 14.60
Southern coke, No. 3.....	14.10 to 14.35
Southern coke, No. 4.....	13.85 to 14.10
Southern gray forge.....	13.60 to 13.85
Southern mottled.....	13.60 to 13.85
Malleable Bessemer.....	15.00
Standard Bessemer.....	17.40
Basic.....	15.50
Jackson Co. and Kentucky silvery, 6 per cent.....	17.90
Jackson Co. and Kentucky silvery, 8 per cent.....	18.90
Jackson Co. and Kentucky silvery, 10 per cent.....	19.90

(By Mail)

**Billets.**—The local billet market offers little of interest beyond recording a firm adherence to prices, which we quote as follows: Forging billets, \$28.60, Chicago, and re-rolling billets, \$23.60.

**Rails and Track Supplies.**—The encouragement afforded by the tonnage returns in early June continues to be well supported and the outlook is considered hopeful. During the past week the local rail mills booked specifications aggregating 25,000 tons, of which 5000 tons were placed by one of the Northern trans-continental systems, and 6000 tons by a Kansas road. Inquiry for cars includes a total of nearly 4000 from Western and Southern roads. Orders for track bolts in lots up to 1000 kegs are reported. We quote standard railroad spikes at 1.65c. to 1.75c., base; track bolts with square nuts, 2.10c. to 2.20c., base, all in carload lots, Chicago. Standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40' to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c. to 1.60c. Chicago.

**Structural Material.**—Mills report that tonnages of both shapes and plates for structural purposes have been placed in increased volume. Building operations reported during the past week indicate larger activity. Contracts were awarded to the Pacific Rolling Mill Company, San Francisco, covering 321 tons for an office building for the San Francisco Investment Corporation, and 723 tons for a similar building for the Banker Investment Company of that city. The Fulton Iron Works, St. Louis, has ordered from the Riter-Conley Mfg. Company, Pittsburgh, 974 tons for a new foundry and machine and blacksmith shops. The American Bridge Company will fabricate approximately 2000 tons for new shop buildings for the Haskell-Barker Company, car builder, Michigan City, Ind. Contracts were also placed for 120 tons for a traction company power house at Pueblo, Colo., and 675 tons for a warehouse for the W. J. Lemp Brewing Company, St. Louis. It is expected that this week will bring out the letting of 1400 tons for the Federal Life Insurance Building, Chicago; 600 tons for the Corn Products Refining Company, Argo, Ill., and 2000 tons for the Woodmen of the World building at Omaha. We quote plain material from mill at 1.53c. to 1.58c. Chicago, and from store, 1.75c.

**Plates.**—For prompt shipment the buying of plates has been active. Tank steel and plates for structural purposes have made up a good portion of the tonnage. A pressure pipe line for the Nisqually Power Plant, Tacoma, Wash., will require 674 tons, to be assembled by the Willamette Iron & Steel Company, Portland, Ore. It is reported with reference to prices that 1.35c. Pittsburgh, has not been absolutely maintained in some quarters. This does not represent, however, the position of large interests. Chicago quotations for mill shipment are: 1.53c. to 1.58c.; from store, 1.75c.

**Sheets.**—Transactions in sheets aggregate a fair tonnage, particularly in the heavier gauges. Buying for forward shipment is limited to October 1 for the jobbers, and to January 1 for manufacturers, but most of the current business is for early shipment. Chicago prices are as follows: Carload lots, from mill: No. 28 black sheet, 2.18c.; No. 28 galvanized, 3.08c.; No. 10 blue annealed, 1.68c. Prices from store, Chicago, are: No. 10, 1.95c. to 2.05c.; No. 12, 2.00c. to 2.10c.; No. 28 black, 2.60c. to 2.70c.; No. 28 galvanized, 3.35c. to 3.45c.

**Bars.**—While the steel bar situation does not seem to have entirely righted itself in some instances where it is reported that consumers are still slow in closing, the past ten days have brought about the closing of a large number of contracts. One maker of bars anticipates that the end of June will find its customers provided for almost entirely. Complaint is heard that prices being made on re-rolled steel and iron bars exercise an unsettling influence on the steel bar situation. On the former grades prices as low as 1.20c. delivered, northern Indiana point, are cited. Steel bar prices are quite firm. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.43c.; bar iron, 1.20c. to 1.25c.; hard steel bars, rolled from old rails, 1.20c. to 1.25c. From store, soft steel bars, 1.70c. to 1.80c., Chicago.

**Wire Products.**—The general line of wire goods has settled into the customary midsummer quiet. Prices have been reduced 10c. per 100 lb. Mill shipments are heavier perhaps than they would otherwise be, because of the very light jobbers' stocks. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.78c.; painted barb wire, 1.78c.; galvanized, 2.18c.; polished staples, 1.88c.; galvanized, 2.18c., all Chicago.

**Cast Iron Pipe.**—The letting by the city of Mandan, N. D., where recently all bids were rejected, is now advertised for June 29. Mena, Ark., will award 750 tons June 23, and Muskogee, Okla., is about to buy 2600 tons. At Colorado Springs 2600 tons was placed June 16, and at Decatur, Ill., the Lynchburg Foundry Company, Lynchburg, Va., obtained an order for 350 tons. We continue to quote as follows, per net ton, Chicago: Water pipe, 4 in., \$25.50; 6 to 12 in., \$24.50; 16 in. and up, \$24, with \$1 extra for gas pipe.

**Old Material.**—The scrap market has been exceedingly inactive. None of the local melters is really in the market except to pick up bargains on small tonnages. No large tonnages are being offered by the railroads, and dealers would hesitate to buy even at attractive prices, fearing their inability to move a large quantity. The Chicago & Alton Railroad offers two lots of 350 tons each, the Chicago & Western Indiana has 400 tons and the Michigan Central 2000 tons. The Union Pacific is offering about 2500 tons. A lot of 500

## THE IRON AND METAL MARKETS

tons of car wheels was sold at \$12.75. We quote below per gross ton:

Old iron rails.....	\$14.00 to \$14.50
Old steel rails, rerolling.....	12.00 to 12.25
Old steel rails, less than 3 ft.....	11.00 to 11.50
Relaying rails, standard sections, subject to inspection.....	24.00
Old car wheels.....	12.50 to 13.00
Heavy melting steel scrap.....	10.25 to 10.75
Frogs, switches and guards, cut apart.....	10.00 to 10.50
Shoveling steel.....	9.75 to 10.25
Steel axle turnings.....	8.50 to 9.00

The following quotations are per net ton:

Iron angles and splice bars.....	\$12.50 to \$13.00
Iron arch bars and transoms.....	13.75 to 14.25
Steel angle bars.....	10.25 to 10.75
Iron car axles.....	18.00 to 18.50
Steel car axles.....	16.00 to 16.50
No. 1 railroad wrought.....	11.00 to 11.50
No. 2 railroad wrought.....	10.00 to 10.50
Steel knuckles and couplers.....	9.00 to 9.50
Locomotive tires, smooth.....	16.25 to 16.75
Machine shop turnings.....	6.25 to 6.75
Cast and mixed borings.....	5.25 to 5.75
No. 1 busheling.....	8.75 to 9.25
No. 2 busheling.....	6.75 to 7.25
No. 1 boilers, cut to sheets and rings.....	7.50 to 8.00
Boiler punchings.....	12.00 to 12.50
No. 1 cast scrap.....	10.25 to 10.75
Stove plate and light cast scrap.....	9.00 to 9.50
Railroad malleable.....	10.00 to 10.50
Agricultural malleable.....	9.25 to 9.75
Pipes and flues.....	8.00 to 8.50

### Cincinnati

CINCINNATI, OHIO, June 21, 1911.—(By Telegraph.)

Interest is centered on Southern iron, which is now obtainable from a number of producers at \$10 at furnace for prompt shipment, and it is rumored that third quarter business has been taken on at this price. A number of Southern furnaces, however, are holding out for \$10.50, Birmingham, on future contracts and it is noteworthy that one or two interests are yet asking \$11, although they are not booking any iron except small lots from customers who have preferences for favorite brands. From Illinois territory several orders are reported for Southern iron averaging about 300 tons each, all for last half shipment. A central Ohio manufacturer took 800 tons of foundry iron, equally divided between Northern and Southern brands, and from the same territory is an order for 1000 tons of Southern No. 2 foundry, both for June-July movement. Northern iron is moving slowly, although there were a few small sales made to nearby melters and it is stated that a southern Ohio manufacturer has taken on an additional 4000 tons of basic over the amount reported last week. Northern No. 2 foundry is quoted at \$13.25 to \$13.50, Ironton, but basic and malleable are firm around the last named figure. Inquiries are scarce, both buyer and seller showing a desire to transact business under cover, and sales made are generally the result of personal solicitation on the part of agency representatives. Based on freight rates of \$3.25 from Birmingham and \$1.20 from Ironton we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry and 1 soft.....	\$13.75 to \$14.25
Southern coke, No. 2 foundry and 2 soft.....	13.25 to 13.75
Southern coke, No. 3 foundry.....	13.00 to 13.25
Southern coke, No. 4 foundry.....	12.50 to 12.75
Southern gray forge.....	12.00 to 12.50
Ohio silvery, 8 per cent. silicon.....	17.45 to 17.70
Lake Superior coke, No. 1.....	14.95 to 15.20
Lake Superior coke, No. 2.....	14.45 to 14.70
Lake Superior coke, No. 3.....	13.95 to 14.20
Basic, Northern.....	14.70 to 15.20
Standard Southern car wheel.....	25.75 to 26.25
Lake Superior car wheel.....	19.50

(By Mail.)

**Coke.**—There is some improvement, so far as the foundry coke inquiry is concerned, but it is not marked enough to have any effect on previous quotations. A large plumbing supply house is asking for a year's supply, and contract will probably be closed in a few days for about 15 cars per week to be delivered throughout the period named. Prices on 72-hour coke in the Pocahontas, Wise County and Connellsville districts range from \$1.90 to \$2 per net ton at oven for prompt shipment, with a premium generally asked of about 25c. a ton on contract business, although there are a few brands that can be bought at \$2 for delivery throughout the next 12 months. Furnace coke is very quiet, and in the absence of any demand spot shipment prices do not improve, averaging in all three fields about \$1.40 to \$1.50 at oven, with 15c. to 20c. per net ton more demanded for future movement.

**Finished Material.**—The inquiry for sheets shows that customers are beginning to realize that the bottom has been reached. There is also some contracting in hoops, which are held at \$1.45c. base, at Pittsburgh, but

it is rumored that a number of mills are not averse to taking care of desirable specifications at 1.40c. per lb. at mil. Steel bars continue firm at \$1.25c. Pittsburgh, and shapes and plates are quoted at 1.35c. Warehouse quotations have not been changed and run from 1.70c. for steel bars to 1.80c. for structural material.

**Old Material.**—Business in this line is so scattered and the total so limited that it is difficult to obtain the right quotations. It is quite probable that some of the figures given below would have to be shaded before any large contracts could be signed up. The low level reached by pig iron has enabled scrap melters to substitute it for scrap, and, as a consequence, few sales of the latter are being made. The rolling mills, however, are asking a fair quantity. Prices for delivery in buyers' yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton.....	\$11.50 to \$12.00
Cast borings, net ton.....	4.50 to 5.00
Steel turnings, net ton.....	5.50 to 6.00
No. 1 cast scrap, net ton.....	9.50 to 10.00
Burnt scrap, net ton.....	6.50 to 7.00
Old iron axles, net ton.....	16.50 to 17.00
Bundled sheet scrap, gross ton.....	7.25 to 8.25
Old iron rails, gross ton.....	13.50 to 14.00
Relaying rails, 50 lb. and up, gross ton.....	21.00 to 22.00
Old car wheels, gross ton.....	10.75 to 11.75
Heavy melting steel scrap, gross ton.....	10.00 to 10.50

### Cleveland

CLEVELAND, OHIO, June 20, 1911.

**Iron Ore.**—The market shows very little life. The only transaction of importance is the reported sale of 500,000 tons of low grade non-Bessemer ore to the Bethlehem Steel Company for delivery over a period of 10 years. This business had been pending for several weeks. The contract is understood to be for ore analyzing about 46 per cent. in iron, natural, at slightly over 8c. per unit delivered. When the inquiry first came out it was understood that the steel company made an offer of 8c. per unit, but it appears that it was unable to secure ore at that price. Ore shipments have increased considerably over May but conditions in the lake trade are still unsatisfactory. We quote prices as follows: Old range Bessemer, \$4.50; Mesaba Bessemer, \$4.25; old range non-Bessemer, \$3.70; Mesaba non-Bessemer, \$3.50.

**Pig Iron.**—Conditions are more active than for many weeks. Foundrymen in this territory are beginning to take an interest in the market for the last half. Inquiries from this source the past few days aggregate about 5000 tons. There is one inquiry for 2000 tons and several for 500 tons and under. The general feeling among furnacemen shows a marked improvement, and it is believed that a fair tonnage will be sold in the next few weeks. In basic iron there is an inquiry for an unspecified tonnage for the last half from a large consumer. A local pipe making plant has bought 1000 tons of No. 4 southern iron for immediate shipment, and another 1000-ton sale of southern iron has been made to a northern Ohio implement manufacturer. A leading manufacturer of sanitary goods is understood to have closed on an inquiry of 1000 tons of southern No. 2 soft and 1000 tons of gray forge for shipment to its Louisville plant in the third quarter. An inquiry from a Michigan implement maker is for 600 tons of analysis iron for the fourth quarter. Quotations on foundry grades are unchanged at \$13.50 to \$13.75. Valley furnace. The demand for Ohio silvery iron is light and lower prices are quoted. The furnace of the Upson Nut Company, Cleveland, went out of blast June 16. For prompt shipment and for the last half we quote delivered, Cleveland, as follows:

Bessemer.....	\$15.90
Basic.....	14.00
Northern foundry, No. 2.....	14.25
Gray forge.....	13.25
Southern foundry, No. 2.....	\$14.35 to 14.85
Jackson Co. silvery, 8 per cent. silicon.....	17.50 to 17.75

**Coke.**—The market is very quiet. Very little inquiry has come out yet for foundry grades for the last half. Quite a few consumers are buying in car lots as needed instead of placing contracts for their requirements. No demand exists for furnace grades. We quote standard Connellsville furnace coke at \$1.45 to \$1.55 per net ton, at oven, for prompt shipment, and \$1.75 to \$1.85 for the last half. Connellsville 72-hour foundry coke is held at \$1.90 to \$2.15 for prompt shipment and \$2 to \$2.40 for the last half.

**Finished Iron and Steel.**—The demand in finished lines shows quite an improvement, and optimistic talk which was lacking for a long time has become quite general. Buyers held back for a time after the recent



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price reductions because of uncertainty as to whether the new prices would be maintained. Prices on steel bars, plates and structural material appear now to be firmly adhered to. While some buyers are still holding off with the hope of getting further price concessions the general feeling among consumers appears to be that prices will be maintained. The improved demand is largely for steel bars. Inquiries for plates, however, are more active than for some time, a fair volume of business being in prospect from tank builders for specific work. In structural lines little work requiring tonnages of any size is pending at present, but the demand for small lots is fairly active, and some good business is in prospect. The demand for sheets has improved somewhat, and most of the small mills appear to be maintaining prices. Some additional steel bar contracts have been closed with implement manufacturers in this territory for delivery until July 1, 1912, on the basis of 1.25c., Pittsburgh. The demand for iron bars is still quiet. We quote iron bars at 1.25c., Cleveland, for outside shipment, but this price is being shaded considerably by some mills in other sections.

**Old Material.**—A local steel plant is in the market for heavy steel scrap for future delivery, for which \$11.25 to \$11.50 is being offered. Heavy steel scrap can be bought at that price for immediate shipment, but dealers are asking around \$12 for future delivery. The market generally is quiet, sales being limited to very small lots. Dealers are holding yard stocks for better prices, selling at current prices only scrap that must be moved. The Wheeling & Lake Erie Railroad closed June 20 on its usual tonnage, and the Michigan Central Railroad has a list out, to be closed June 21. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling.....	\$13.00 to \$13.50
Old iron rails .....	15.00 to 15.50
Steel car axles .....	17.50 to 18.00
Heavy melting steel .....	11.25 to 11.50
Old car wheels .....	11.50 to 12.00
Relaying rails, 50 lb. and over.....	22.50 to 23.50
Agricultural malleable .....	10.75 to 11.00
Railroad malleable .....	11.00 to 11.50
Light bundled sheet scrap.....	7.50 to 8.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles .....	\$21.00 to \$21.50
Cast borings .....	6.00 to 6.25
Iron and steel turnings and drillings.....	6.50 to 6.75
Steel axle turnings .....	8.00 to 8.50
No. 1 bushing .....	9.50 to 10.00
No. 1 railroad wrought.....	11.50 to 12.00
No. 1 cast .....	11.25 to 11.50
Stove plate .....	9.50 to 10.00
Bundled tin scrap .....	11.00 to 11.50

### Philadelphia

PHILADELPHIA, June 20, 1911.

The iron market shows no marked change. With few exceptions the demand is confined to small lots. The more cheerful feeling in finished materials has been sustained in a measure by a better run of small orders and by larger specifications, a condition which is considered encouraging, particularly at this season, when the usual summer dullness is due to set in. In some instances inquiries have increased and consumers are inclined to cover for more extended deliveries, but in few cases have finishing mills in this district increased their productive rate. More business is moving in the coke market, particularly with foundry grades. The old material market, while sentimentally stronger, is practically unchanged.

**Iron Ore.**—Reports are heard of a heavy purchase of Swedish ore by one of the Eastern independent steel plants, but lack definite confirmation. With this exception little is doing in the ore trade. Importations during the week were confined to Cuban ore, of which the arrival of 5300 tons is reported.

**Pig Iron.**—With the exception of the inquiry of the Pennsylvania Railroad covering 2500 tons of coke foundry and 1500 tons of charcoal iron for third quarter delivery, on which bids go in this week, the market has been bare of any important new inquiries. The demand for foundry grades has been confined to small lots and sales have been gradually diminishing, as is customarily the case prior to the usual midyear holiday. Eastern Pennsylvania furnaces as a rule maintain the recent range of prices for standard brands of No. 2 X and No. 2 plain pretty firmly at \$15.25, delivered, as a minimum for the former, and \$15 for the latter grade. One prominent producer has however determined on a more aggressive selling policy and has announced that No. 2 X foundry, of standard analysis, will be sold in moderate lots for third quarter shipment at \$15, deliv-

ered in this vicinity, and that \$15.25, delivered, will be acceptable for the same grade for delivery extending over the last half of the year. The movement in Virginia foundry grades has quieted and only occasional small lot sales are reported, the leading interest still quoting \$12.25, Virginia furnace, for No. 2 X for third quarter delivery, although some of the other producers continue to obtain an advance of 25 cents a ton. Small lot sales of Southern No. 2 foundry for early shipment to consumers in this district are reported where desirable freight rates are to be obtained, bringing the delivered price below quotations for eastern Pennsylvania brands. Such transactions have not, however, been of sufficient importance to have an effect on the prices named for local brands. Cast iron pipe foundries would no doubt make further purchases of low grade iron did not the weakness of Southern iron cause them to await further developments. Forge iron continues inactive. Consumers show no interest in the market and sellers' ideas of prices range from \$14.50 to \$14.75, delivered, for rolling mill grades. No new inquiry for basic iron is reported. Negotiations are still pending for a block of this grade for third quarter delivery, but the prospective buyer appears to be in no hurry to place the order. The minimum quotation is still \$14.50, delivered, but all producers are not willing to book orders for forward delivery at that basis. An inquiry for 1000 tons of low phosphorus iron has come out. Sales of standard brands continue to be made in small lots at unchanged prices. The following prices are named for standard brands, delivered in buyers' yards in this territory, for third quarter shipment:

Eastern Pennsylvania No. 2 X foundry.....	\$15.25 to \$15.50
Eastern Pennsylvania No. 2 plain.....	15.00 to 15.25
Virginia foundry .....	15.05 to 15.50
Gray forge .....	14.50 to 14.75
Basic .....	14.50 to 14.75
Standard low phosphorus.....	20.50 to 20.75

**Ferromanganese.**—A few inquiries for carload and 50-ton lots for early delivery have developed. Large lot buying is at a standstill. In the absence of any important business, quotations are largely nominal at \$36.60, for either prompt or last half shipment.

**Billets.**—More inquiry has developed and some consumers are feeling the market for more extended deliveries, particularly for forging billets, for which one inquiry covering several thousand tons is reported. Consumers of rolling billets confine their inquiries to lots of a few hundred tons, for the most part for early delivery. Actual business taken by producers shows no material increase, but the feeling in the trade is more optimistic. For early delivery in this district open hearth rolling billets are quoted at \$23.40, with ordinary forging billets at \$28.40, delivered.

**Plates.**—A fair volume of business continues to come out. For the greater part orders are small, although one of comparatively good quantity is occasionally taken. Mills have not increased their productive rate, but feel encouraged in that they are able to maintain an even basis at this season. A comparatively good demand for boiler, tank and locomotive steel exists, while round lots of boat plates are being figured on. Upwards of 9000 tons are asked for a Government collier. The recent price basis of 1.50c. minimum for ordinary plates delivered in this territory is being fully maintained.

**Structural Material.**—The smaller fabricators report more quiet conditions. A fair amount of business is being figured, but little is placed. Fabricated prices are still reported extremely low, considerably lower in some instances than the smaller interests can name. Prospective new business which is expected to be closed at an early date includes 1,600 tons for the new Ritz Hotel in this city, and about the same amount for a new hotel in Wilmington, Del. The Baltimore Bridge Company is reported to be the low bidder on about 400 tons for wireless towers for the Federal government. A shade more bridge work from some of the eastern railroads is also in prospect. The demand for plain shapes is not particularly active. Prices are fully maintained at 1.50c. minimum for plain material, delivered in this district in the next three months.

**Sheets.**—Business continues to increase in volume and mills in this district are now fully engaged, with the prospect of continuing so until the month's end. Consumers still confine their orders to moderate lots for reasonably early delivery, but the aggregate business is comparatively good. Prices are firm, the range of quotations f.o.b. eastern makers' mills, being: Nos. 18 to 20, 2.30c.; Nos. 22 to 24, 2.40c.; Nos. 25 and 26, 2.50c.; No. 27, 2.60c.; No. 28, 2.80c.

**Bars.**—Contracts with the larger consumers of steel bars in this district are reported to be cleaned up pretty

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generally and specifications against them are freely made. A moderate though irregular demand for refined iron bars is to be noted, the bulk of the orders being for small lots placed at unchanged prices. Refined iron bars continue to be quoted at 1.27½c. to 1.32½c., and steel bars at 1.40c., delivered here.

**Coke.**—More activity is to be noted, both in foundry and furnace grades. A number of contracts have been made covering 1000-ton lots of foundry coke for last half shipment, at prices ranging from \$2 to \$2.35 at ovens, according to quality. Several round lots of foundry coke are still under negotiation, including one of 6000 tons for delivery over the remainder of the year. Small prompt sales continue to be made at \$1.90 to \$2.00, ovens. More interest is shown in furnace coke, the principal inquiry being from an eastern furnace for a lot of 24,000 tons for last half delivery. About \$1.60 to \$1.75 ovens, represents the range of the market for forward foundry coke, although spot furnace coke is reported available at \$1.40 to \$1.50, ovens. The following range of prices per net ton is named for deliveries in this vicinity:

Connellsville furnace coke.....	\$3.65 to \$4.00
Foundry coke .....	4.10 to 4.55
Mountain furnace coke.....	3.25 to 3.60
Foundry coke .....	3.70 to 4.15

**Old Material.**—Transactions continue light, mills take occasional small lots in various grades, but the principal movement has been between dealers. Notwithstanding the continued quiet the market is sympathetically stronger and prices show no change. Small lots of heavy melting steel are taken by mills at about \$13.25 delivered, for prime material. Rolling mills are showing no great interest in the market, although one consumer is feeling around for a large lot of wrought scrap. Quotations, while largely nominal, for moderate quantities, for early delivery, in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia varying from 35c. to \$1.35 per gross ton, follow:

No. 1 heavy melting steel scrap.....	\$13.00 to \$13.25
Old steel rails, rerolling.....	13.75 to 14.25*
Low phosphorus heavy melting steel scrap..	16.75 to 17.25
Old steel axles .....	19.25 to 19.75*
Old iron axles .....	24.00 to 24.50
Old iron rails .....	16.50 to 17.00
Old car wheels .....	13.00 to 13.50
No. 1 railroad wrought.....	15.00 to 15.50
Wrought iron pipe .....	12.00 to 12.50
No. 1 forge fire.....	10.50 to 11.00
No. 2 light iron .....	6.75 to 7.25*
Wrought turnings .....	8.50 to 9.00
Cast borings .....	8.00 to 8.50
Machinery cast .....	13.00 to 13.50
Railroad malleable .....	11.50 to 12.00
Grate bars, railroad .....	10.00 to 10.50
Stove plate .....	9.75 to 10.25

\*Nominal.

### St. Louis

ST. LOUIS, Mo., June 19, 1911.

The week has been a good order period in nearly every line. Though no large sales and no rail contracts have been made, both the railroads and the general contractors have been specifying freely, the former on all materials and the latter on contracts. The consumption of pig iron continues steady, with no striking features to the market and the same may be said of coke. In other lines the general situation is much the same, but with it all is a much stronger feeling that the dullness has practically reached its end and that a renewal of activity will come within a very short time. The character of the specifications received has much to do with this sentiment. The larger buyers are apparently showing a greater interest in the market, though they are not committing themselves with orders.

**Pig Iron.**—With a fair total of general business showing in pig iron, inquiries have a better tone. Although the larger consumers are still out of the market so far as actual orders and new business are concerned, an interest is shown that indicates better things before long. Inquiries have less the appearance of indefinite feelers, and some reports of sales are coming out, including one for 1000 tons, equally divided between No. 2 Northern and No. 2 Virginia for last quarter delivery. An implement company has out an inquiry for approximately the same tonnage in about an equal division between Northern and Southern product, and also an inquiry for between 600 and 700 tons of No. 2 Southern. The quotations continue about as they have in the past few weeks, but assertions by buyers continue that they are getting No. 2 Birmingham at \$10. The basic market is apparently without life, in spite of a report of the purchase by the Commonwealth of 5000 tons. If the

deal was made it was kept well under cover. In general the requirements of the industries which have been steady users of pig have kept up to the mark that has been maintained for some weeks.

**Coke.**—While the coke market has no strikingly new features, requisitions on contracts continue to come in fairly well, in fact a little better than for some time. The foundries are taking coke in good volume and some consumers are asking prices for delivery during the next few months, while a few are making inquiries for six months and year delivery. For spot delivery \$2.00 is quoted with \$2.25 for Virginia and \$2.50 for Connells-ville, best 72-hr. selected, for future deliveries. One report is of a sale of 6000 tons at prevailing prices for last half delivery. No other contracts are noted, but general increase in the optimism of the market is shown, which may lead to better things soon.

**Finished Iron and Steel.**—The past week orders have been coming in more freely than for some time, and, while no large sales and no rail contracts have been made, the railroads have been specifying freely in all materials, which is taken as a good sign for the early future. The Missouri Pacific orders recently noted have been formally closed. In light rails some request from the coal mines has been received, with little or nothing from the lumber mills. In structural iron the situation has been better than for months and the contractors are specifying very freely against contracts, indicating very clearly that they are without material on hand, their requisitions being for quick delivery. The mills are in a position to make such deliveries and the combination of circumstances has helped in improving the tone of the situation. The bar specifications also are better, but the buyers are not yet in the market as freely as expected. Plates are quiet, with very little movement. Track fastenings, etc., are in active request.

**Old Material.**—The situation in scrap is as dull as ever. The dealers are speculating a little, but otherwise there is very little new to note. The Vandalia list which was reported last week brought good prices, but with no particular occasion therefor except a speculative disposition. In general, however, the tone of the market is better, in a feeling of prospective activity. This may be the result of the improved disposition in the new material situation. Dealers' prices per gross ton, f.o.b. St. Louis, are as follows:

Old iron rails.....	\$12.50 to \$13.00
Old steel rails, rerolling.....	11.25 to 11.75
Old steel rails, less than 3 ft.....	10.25 to 10.75
Relaying rails, standard section, subject to inspection .....	23.00 to 23.50
Old car wheels.....	12.00 to 12.50
Heavy melting steel scrap.....	10.25 to 10.75
Frogs, switches and guards cut apart.....	10.25 to 10.75

The following quotations are per net ton:

Iron fish plates.....	\$10.25 to \$10.75
Iron car axles.....	18.00 to 18.50
Steel car axles.....	17.00 to 17.50
No. 1 railroad wrought.....	10.50 to 11.00
No. 2 railroad wrought.....	9.50 to 10.00
Railway springs .....	9.00 to 9.50
Locomotive tires, smooth.....	15.50 to 16.00
No. 1 dealers' forge.....	8.50 to 9.00
Mixed borings .....	4.50 to 5.00
No. 1 busheling.....	8.50 to 9.00
No. 1 boilers, cut to sheets and rings.....	7.50 to 8.00
No. 1 cast scrap.....	9.50 to 10.00
Stove plate and light cast scrap.....	8.00 to 8.50
Railroad malleable .....	8.00 to 8.50
Agricultural malleable .....	7.00 to 7.50
Pipes and flues.....	7.25 to 7.75
Railroad sheet and tank scrap.....	7.25 to 7.75
Railroad grate bars.....	7.50 to 8.00
Machine shop turnings.....	6.00 to 6.50

### Buffalo

BUFFALO, N. Y., June 20, 1911.

**Pig Iron.**—The market has very little life, although inquiries mostly for small lots are still coming in from New England and New York State points. A number of inquiries have also been received in this market in the week from the Pittsburgh and Philadelphia districts. Very few orders are reported as booked, the largest noted being for 300 tons No. 2 X from New England for last half delivery. The remainder consists of small lot and carload orders from small foundries, and repeat orders from regular customers. One furnace interest is sold up to the end of the last half and has discontinued all low quotations. Shippers are still taking iron on old contracts in good volume and shipments via the Erie Canal will be heavy now that the break which has been holding up canal shipments has been repaired. The week has shown a still further tendency toward softer prices. It is stated that one furnace has quietly



# THE IRON AND METAL MARKETS

negotiated No. 2 X at \$13 furnace, but this cannot be confirmed and most furnaces are adhering to \$13.25 f.o.b. Buffalo as rock bottom for 2 X, and \$13 f.o.b. Buffalo for Nos. 3 and 4 iron. One or two interests absolutely refuse to take business at these prices.

We quote as follows for last half deliveries f.o.b. Buffalo:

No. 1 X foundry.....	\$13.75 to \$14.25
No. 2 X foundry.....	13.25 to 14.00
No. 2 plain.....	13.25 to 13.75
No. 3 foundry.....	13.00 to 13.25
Gray forge.....	13.00 to 13.25
Malleable.....	13.75 to 14.25
Basic.....	14.00 to 14.75
Charcoal.....	16.50 to 17.25

**Finished Iron and Steel.**—The general situation in finished products shows continued improvement, and there is a more hopeful feeling among both buyers and sellers, and considerable contracting for bars and structural material for shipment during the third and fourth quarters, the prevailing opinion being that the bottom has been reached and the turn of the market is at hand. The Canadian export trade has been exceptionally good during the week. From 15,000 to 20,000 tons of skelp has been sold the past week to one of the large steel pipe manufacturers of Canada for delivery over the remainder of the year. Several large purchasers of tin plate have also been made for Canadian shipment, aggregating 20,000 boxes.

In fabricated structural lines business maintains a good volume. The contract for 2800 tons of girders, columns and grillage for the Larkin Company's warehouse, Buffalo, was awarded to the McClintic-Marshall Company, Pittsburgh. The Buffalo Structural Steel Company was this week given the contract for the fabrication and erection of 250 tons of steel for the German Deaconess' Hospital. Deferred bids for the steel work for the Hutchinson High School, Buffalo, 800 tons, are to be received this week, and bids for the extension of the Canadian Niagara Power Company's power house underneath Table Rock, Victoria Park, Niagara Falls, requiring 500 tons, are also to go in this week. The Goulds Mfg. Company, Seneca Falls, N. Y., has placed the contract with the Jones & Laughlin Steel Company for 375 tons of structural steel for the new factory buildings. The contract is also to be let this week for 1000 tons of reinforcing bars for the Eastman Kodak Company's new factory buildings at Rochester, N. Y.

**Old Material.**—The market, although still very dull, shows some indications of revival. Consumers are beginning to exhibit a slight interest; but actual transactions are extremely limited in number, and of small tonnages. The principal buying is by dealers, who are taking into stock such offerings as are obtainable at reasonable prices, in anticipation of a wider buying movement by consumers a little later. Owing to the limited supply of turnings and borings obtainable on account of reduced operations in machine shops in some localities, a tendency exists toward stiffer prices for these grades. Otherwise the price situation is unchanged. We quote as follows per gross ton f.o.b. Buffalo, most of the prices shown being nominal:

Heavy melting steel.....	\$11.50 to \$12.00
Low phosphorus steel.....	14.00 to 14.50
No. 1 railroad wrought.....	13.50 to 14.00
No. 1 railroad and machinery scrap.....	12.75 to 13.25
Old steel axles.....	18.00 to 18.50
Old iron axles.....	22.00 to 22.50
Old car wheels.....	12.50 to 13.00
Railroad malleable.....	11.50 to 12.00
Boiler plate.....	9.50 to 10.00
Locomotive grate bars.....	10.00 to 10.25
Pipe.....	9.00 to 9.25
Wrought iron and soft steel turnings.....	6.25 to 6.75
Clean cast forgings.....	6.00 to 6.25

## Birmingham

BIRMINGHAM, ALA., June 19, 1911.

**Pig Iron.**—The market continues quiet with little or no change in prices. The volume of inquiries is small and for actual requirements only. No disposition has developed among the foundrymen to speculate on the present low market, though everyone seems to realize it has about reached bottom. The usual tendency under like conditions to over-buy for future requirements has not developed, neither buyer nor seller seeming to show any aggressiveness. The furnace production is at a low ebb here, with consumption and production running about even. Prices are held pretty firmly here at \$10.50 for No. 2 with reports of a few exceptional sales at \$10.25. Raw material, labor conditions and other factors entering into the manufacture of pig iron are quite satisfactory, the only cloud on the horizon being the ex-

treme low prices. All interests feel that the early fall will bring better prices and an increased volume of business. Quotations are unchanged, as follows, per gross ton f.o.b. furnaces, Birmingham district:

No. 1 foundry and No. 1 soft.....	\$11.00
No. 2 foundry and No. 2 soft.....	10.50
No. 3 foundry.....	10.00
No. 4 foundry.....	9.75
Gray forge.....	9.50
Mottled.....	9.25
Standard basic, chill cast.....	10.50
"Off Basic".....	10.00
Charcoal carwheel iron.....	22.50

**Cast Iron Pipe.**—Quite a number of inquiries for good round lots of water pipe have been received the past week, mostly from the Coast and Central West, all of which will, it is thought, result in considerable new business. The shops now running feel confident of an active summer, with their plants running fairly full. Quotations are nominally as follows: Per net ton, f.o.b. cars here: 4 to 6 in., \$22.50; 8 to 12 in., \$22; over 12 in., \$21, with \$1 per ton extra for gas pipe.

**Old Material.**—A lack of interest is apparent in this market, with very little demand. The extreme low price of iron has more or less demoralized the scrap market, consumers preferring to use the regular iron, it being so cheap and the saving on scrap so small. Only certain classes of scrap, such as rolling mills use, seem at all in demand. Dealers are quoting as follows:

Old iron axles (light).....	\$13.50 to \$14.00
Old steel axles (light).....	12.50 to 13.50
Old iron rails.....	12.50 to 13.00
No. 1 railroad wrought.....	11.00 to 11.50
No. 2 railroad wrought.....	9.50 to 10.00
No. 1 country wrought.....	7.50 to 8.00
No. 2 country wrought.....	7.00 to 7.50
No. 1 machinery.....	9.50 to 10.50
No. 1 steel.....	8.50 to 9.00
Tram car wheels.....	8.00 to 8.50
Standard car wheels.....	9.50 to 10.50
Light cast and stove plate.....	7.00 to 7.50

**Coal and Coke.**—Business has been unusually dull for 60 days on both coal and coke, which is not, however, unusual for this time of year. It is now the middle of the contracting season, and all interests are busy closing contracts for the next twelve months' requirements. Competition is very close, and last year's prices are being shaded on nearly all contracts. It is expected that a normal tonnage will be placed.

## New York

NEW YORK, June 21, 1911.

**Pig Iron.**—The week has been characterized by a much stronger demand for foundry iron. From 12,000 to 15,000 tons has been quietly bought by two or three consumers for scattered delivery. The circumstances attending these purchases indicated that the buyers were impressed with the belief that this is an opportune time to cover direct requirements. An additional sale was of 2500 tons to a large manufacturer of soil pipe. Considerable quantities of pig iron are also under negotiations for various deliveries. These developments, coming as they do at this time, appear to have considerable significance. They are not stimulated by any advance, but on the contrary pig iron prices appear to be slightly softer. Every concession, however, undoubtedly brings the market closer to rock bottom, from which, of course, there will be a quick recovery when the demand becomes general. A feature of present conditions is that specifications on contracts are fully up to terms, and instances are occurring of shipments being ordered at a slightly more rapid rate than named in contracts. Northern iron at tidewater is quoted as follows: No. 1 foundry, \$15.50 to \$15.75; No. 2 X, \$15 to \$15.50; No. 2 plain, \$14.50 to \$15; Southern No. 1 foundry is quoted at \$15 to \$15.50; No. 2, \$14.50 to \$15.

**Cast Iron Pipe.**—An eastern Pennsylvania foundry secured the contract for 1200 tons of water pipe on which bids were opened June 15 by Newark, N. J., at \$20.47 per net ton, delivered. A foundry in southern New Jersey secured the contract for 450 tons for Yonkers, N. Y., on which bids were opened June 19, at \$21.65; quite a wide range was observed in these bids, some foundries naming as high as \$23.50, which is claimed to be close to their actual cost, although their foundries are among the best and most efficiently managed in the country. The city of New York will contract June 28 for a quantity of water pipe, but specifications have not yet been announced. Very few public lettings are coming out, and the demand from private buyers has again subsided to small proportions.

## THE IRON AND METAL MARKETS

Carload lots of 6 in. are quoted at \$21 to \$22 per ton, tidewater.

**Finished Iron and Steel.**—A demand fluctuating slightly from day to day but of the magnitude which has prevailed for several weeks marks present conditions. Bar iron is perhaps a little livelier, with no betterment in prices. The strike of boilermakers is practically settled, incidentally resulting in an increase in the number of open shop employees, and local business in plates may as a result pick up. A reported improvement in fabricating prices was not found to be the general experience, but there is perhaps a growing feeling that contractors may be overstaying the market regarding price changes and may well hasten to close contracts. Of new work the largest transactions are as follows: 3500 tons of bridges, Baltimore & Ohio; 1200 tons for an 8-story pavilion, Bellevue Hospital, New York; 600 tons for four bridges, New York Central; 500 tons, Dey Brothers & Co., department store, Syracuse, N. Y.; 800 tons for Golden 11-story loft building at Lafayette and Howard streets, New York, and 300 tons for a laboratory for Yale University. The letting of the 1000 tons of the Rochester, N. Y., station of the New York Central has been postponed to next week. A late unverified report is that plans will shortly be ready for the Chesapeake & Ohio office building and the Richmond Trust Company building, Richmond, Va. Some of the bridge contracts awarded were: Lehigh & New England Railroad, 400 tons, and Erie Railroad, 1500 tons, both to American Bridge Company; Atlantic Coast Line, 400 tons, to Pennsylvania Steel Company; Atlantic Coast Line, Altamaha River, 2000 tons, to McClintic-Marshall Construction Company. Some of the late building contracts are: Loft, Twenty-third street, New York, 700 tons, to Hinkle Iron Company; loft, West Twenty-fifth street, 600 tons, to A. E. Norton Company; Smith building, Providence, 500 tons, to Providence Steel & Iron Company; Cuyler Realty building, West Thirty-first street, New York, 2300 tons, and Mayer apartment house, Park avenue and Seventy-eighth street, 1000 tons, to American Bridge Company. The Baltimore Bridge Company was the lowest bidder for 900 tons for wireless telegraphing towers for erection at Fort Myer, Va. The general contract for the Hartford National Bank building, 500-ton steel structure, has, it is understood, been given to Wells Brothers Company. The Canadian Car & Foundry Company is reported placing 50,000 tons of shapes with the United States Steel Products Company. Quotations are: Plain structural material and plates, 1.51c. to 1.56c.; steel bars, 1.41c. to 1.46c.; bar iron, 1.30c. to 1.37½c., all New York. Plain material and plates from store, New York, 1.80c. to 1.90c.

**Old Material.**—Transactions seldom run beyond a moderate tonnage, but more or less buying characterizes the entire market. In heavy melting steel scrap a few sales have been made, but none amounted to more than 300 or 400 tons. Sales of small lots of old car wheels have been made for shipment to New England consumers. Foundries are buying cast iron scrap in quantities merely sufficient to cover their wants for a week or two. Wrought scrap is probably the most neglected article in the list, and prices have gone off slightly. Quotations are as follows, per gross ton, New York and vicinity:

Old girder and T rails for melting.....	\$10.50 to \$11.00
Heavy melting steel scrap.....	10.50 to 11.00
Relaying rails.....	20.00 to 21.00
Re-rolling rails..... (nominal)	12.00 to 12.25
Standard hammered iron car axles.....	21.00 to 21.50
Old steel car axles.....	16.75 to 17.25
No. 1 railroad wrought.....	12.75 to 13.25
Wrought iron track scrap.....	12.00 to 12.50
No. 1 yard wrought, long.....	11.50 to 12.00
No. 1 yard wrought, short.....	10.00 to 10.50
Light iron.....	4.25 to 4.75
Cast borings.....	5.25 to 5.75
Wrought turnings.....	6.25 to 6.75
Wrought pipe.....	9.50 to 10.00
Old car wheels.....	11.00 to 11.50
No. 1 heavy cast, broken up.....	11.00 to 11.50
Stove plate.....	8.50 to 9.00
Locomotive grate bars.....	8.50 to 9.00
Malleable cast.....	10.00 to 10.50

**Ferroalloys.**—A few carload lots of ferromanganese have been sold, and an inquiry is in hand for 300 tons. Prices rule at about \$36.50, Baltimore. A New Jersey steel company bought a small lot of 50 per cent. ferro-silicon at around \$51.75, delivered.

The Republic Iron & Steel Company expects to have its new 110-in. plate mill in operation some time in October and its new combination 14 and 16-in. finishing mill also ready for operation early in the fall.

### The German Iron Market

BERLIN, June 9, 1911.—The iron trade continues quiet, with a tendency toward lower prices. The downward movement in bars, in particular, persists, and some other departments of the trade are likewise weaker. This is due in large part to the artificial circumstance that the members of the Steel-works Union are exerting themselves to their utmost to get orders and keep their production up to the top-notch so as to obtain big allotments upon the renewal of the combination next year. Contrary to the general tendency of the trade, pig iron, as is now confirmed, has actually risen a mark or two per ton in the finer Siegerland numbers, because of the belief that the Essen Syndicate will still be perfected and the remaining outsiders brought into the fold. The expectation, however, is evidently too optimistic, for fresh obstacles have quite recently presented themselves, and it is far from certain that the one big syndicate will be realized. Nevertheless, furnacemen are little disposed to take orders at existing prices and are refusing them altogether for 1912 delivery, hoping that they will be able to enforce better prices after the syndicate has been reorganized. The offerings of scrap and old material have increased and prices are weaker. In finished products a waiting tendency on the part of consumers is noted, so far at least as long-term orders are concerned, while materials for immediate consumption are still being ordered as needed, with the shortest possible dates for delivery, which indicates that supplies have run pretty low with consumers.

Today the provisional figures of the Union for Class A goods (rails, structural forms and semi-manufactured products) for May were given out, showing an uncommonly high total. Shipments of the three classes of products reached 525,000 tons, as against 440,400 tons in April and 387,600 tons in May, 1910. Shipments last month were the heaviest ever known, except in March, 1910 and 1911, in which month the companies are always hurrying deliveries to clean up the year's business and make a good showing on the Union's books. The biggest increase in the May shipments was in steel rails and ties, which amounted to 200,000 tons, or nearly 63,000 tons more than in May, 1910. Structural shapes also show a good record with 196,000 tons, or about 18,000 tons more than last year. The latter figure reflects the activity in the building trades, which has been fully maintained or even augmented. It is believed that the heavy movement in rails can hardly be continued. Foreign orders, indeed, are still coming in to some extent, and other business is in sight, but export orders are not expected to keep up to their present level. Work on light rails continues very good, both on home and foreign orders.

### The Export Trade

The foreign trade figures for May indicate the continuance of a rather light export movement, except in steel rails, which gained about 21,000 tons in a total of 51,700 tons over May, 1910. Exports of ingots and blooms reached 37,400 tons against 39,100, beams 29,100 tons against 37,000 and steel ties and other track-building supplies 6100 tons against 13,300. Exports of pig iron totaled 80,100 tons against 70,000 and imports 9796 tons against 13,000.

Work on semi-manufactured products continues at the normal rate, but little new ordering is to be reported, home consumers having already provided for the most part for their requirements for the September quarter. Prices for export have further weakened somewhat under Belgian influences, although that market has this week for the first time in a month or two sent in no bad news. Export prices for billets, free on board ship, are 81 to 82 marks and muck-bars 85 to 86 marks. Export business in this department has grown considerably quieter.

The bar mills are eagerly in quest of foreign business, and price-cutting continues, especially in competition with Belgian works. Business in wrought-iron bars on the other hand, continues pretty good, few manufacturers of this specialty being left in the trade, and competition therefore being less serious. Prices at the mills are around 133 marks. In bands the conditions outlined in last week's report continue, with prices still further depressed, ranging between 130 and 135 marks. One authority asserts that prices have receded 15 marks within a fortnight. In cold-rolled bands business is quieter. Steel skelp for tube-making is in steady demand. For the next quarter prices of



skelp for boiler tubing range between 122.50 and 127.50 marks, according to width and for gas pipes 137.50 to 142.50 marks. Makers of steel tubing complain that selling prices are quite unprofitable.

### Structural Market Improves

The demand for beams and other structural forms has improved, both from the building trades and from construction shops. The export market also continues to take pretty good amounts, but chiefly upon orders given some time ago. The export price is 106 marks, free on board ship, with rebates in certain cases. Heavy plates continue to be the strongest section of the trade. Shipyards cannot get manufacturers to deliver plates as rapidly as wanted, and there is a good prospect for a still heavier demand from this source, a number of large steamers having been ordered recently. Locomotive and engine works are also calling for large quantities of plates. Mills running on medium thicknesses have enough work on hand, but orders for thinner qualities are rather unsatisfactory. In wire-stock and wire a waiting attitude is noted, in view of the uncertainty as to whether the wire association will be prolonged or not. Next week will bring the decision of the matter. In this department of the trade, as in some others, the conflict of interests between the big union companies and the mills confined exclusively to wire or to wire and wirestock, is felt more and more. The trouble is that the big companies in the union are trying to squeeze the small wire mills.

Locomotive shops are doing an unusually good business. This week the Paris-Lyons Railway has ordered 20 express train locomotives at Cassel and an equal number of freight locomotives at Cologne. The general machinery trade shows great activity. A labor market report shows much fewer workmen seeking jobs in this branch than last year. Machinery prices, however, except for specialties, are pronounced by shop owners quite unsatisfactory. Like complaint is heard from managers of construction shops, although they are well supplied with orders.

The Krupp Company is enlarging its plant at Rheinhafen on the Rhine opened several years ago. An electrical central station is being built, and the steel mills enlarger. A Portland cement factory will also be erected.

The ore market is quiet, with not much disposition among furnacemen to buy foreign ores at the existing high prices. Mediterranean ores have recently become somewhat cheaper, and business in them is better. Ore imports in May reached 842,900 tons, or 31,700 tons more than in May, 1910, but about 400,000 tons less than in April, 1911.

Cable dispatches from Berlin this week announce the forthcoming dissolution of the German steel wire pool, which presages a price war in that important branch of industry.

## Metal Market

NEW YORK, June 21, 1911.

### The Week's Prices

		Copper, New York.		Lead.		Spelter.	
		Electro.	Tin.	New York.	St. Louis.	New York.	St. Louis.
June.	Lake.	lytic.	New York.	York.	Louis.	York.	Louis.
15.....	12.75	12.50	45.50	4.47½	4.32½	5.62½	5.42½
16.....	12.75	12.50	43.50	4.50	4.35	5.70	5.45
17.....	12.75	12.50	.....	4.50	4.35	5.70	5.50
19.....	12.75	12.50	43.85	4.50	4.35	5.75	5.55
20.....	12.75	12.50	44.65	4.50	4.35	5.75	5.55
21.....	12.75	12.50	44.87½	4.50	4.35	5.75	5.55

The corner in pig tin has apparently been broken, the metal being 2c. per lb. cheaper than a week ago. Copper is strong. Both lead and spelter are higher.

**Copper.**—It would be a hard matter to estimate what the sales of copper have been during the last two weeks, but it is certain that the buying was heavier than in any other two weeks of the year. Within the last few days the demand has fallen off, but a good call for the metal still exists. Prices are decidedly firm and resilient as they were a week ago. Electrolytic is 12.50c. and Lake is 12.75c. The United States Metals Selling Company is making the market just now and other prominent sellers are as a rule ¼c. higher than the market price. This means that many of them have practically withdrawn for the time being. Considerable of the Lake copper bought, in the last two weeks brought as high as 12.87½c., and there were sales made at 12.90c. The brass manufacturers were the heaviest purchasers, but the buying was pretty well distributed and it is a significant fact that purchasing was not only general but chiefly in small lots. The London market this morning was firm, with spot copper selling at £57 5c. and fu-

tures, £57 17c. 6d. The exports of copper so far this month have been heavy, amounting to 19,527 tons.

**Pig Tin.**—The pig tin syndicate let go its hold of the London market last Friday and quotations have been on the downward trend ever since. To-day the American market is 2c. lower than it was a week ago, and in London this morning spot tin was down to £193 5d., as against £230 a week ago to-day, while futures which brought £187 5d. last week were selling at £191 15s. this morning. The information that the syndicate expected to end the squeeze on June 20 was not without foundation, as last Thursday it was announced that pig tin could be bought for delivery until June 21 for £230, while the holders were willing to take £5 less for delivery after that date. From the same source that the information regarding the probable end of the squeeze came it is learned that about all the short contracts in London have been covered. On the return of this market to more normal conditions last Thursday and Friday there was heavy buying. It is estimated that nearly 800 tons of spot tin was sold and sales were made for delivery as far ahead as the middle of June. Those who had spot to dispose of did a handsome business and replaced their stocks three weeks ahead of from 1c. to 2½c. less than the price they took for spot. Pig tin was offered in this market this morning at 44.87½c. The arrivals of pig tin in this country so far this month have been light, amounting in all to 1557 tons, while there are 990 tons afloat, most of which will be in port before the month is out.

**Tin Plates.**—Regardless of the slump in the pig tin market the price of foreign tin plates this morning was higher than a week ago, being quoted at 14s. at Swansea, Wales. The domestic market is quiet at \$3.94 for 100-lb. coke plates.

**Lead.**—While the demand for lead is not heavy the market has an upward trend and outside sellers are now demanding the price that the syndicate has held to since early in the year, which is 4.50c. New York and 4.35c. St. Louis. There was a bulge in lead last Thursday and Friday, due largely to stronger prices in other non-ferrous metal markets.

**Spelter.**—The spelter market is hard to quote, as sellers do not seem to be so well organized as they were a few months ago. The market has been steadily climbing all week and there is a much better demand. Stocks are said to be light and it is certain that consumers who bought sparingly since early in January are in need of the metal. While there have been some purchases by speculators, the offerings are so light that the increase in value seems to be warranted. Spelter in St. Louis is now at 5.55c. and it is very firm in New York at 5.75c. The daily prices quoted above are on sales, but the range during the week has been very wide from day to day.

**Antimony.**—The antimony market has taken a sudden turn and it is apparent that foreign syndicate operators have been disappointed in their plans. A great deal of quiet undercutting has been done and some producers who have refused to enter the syndicate have disposed of a great deal of surplus stocks. It is reported that a heavy cut in Cookson's antimony is to be made very shortly. The price this morning was 9c. Hallett's is down to 8.75c. and it can be bought for July delivery at fully 1c. less than that price. Hungarian grades are nominal at about 7.25c. The general demand is light.

**Old Metals.**—Conditions are improving and dealers' selling prices, New York, are somewhat higher, as follows:

	Cents.
Copper, heavy cut and crucible.....	12.00 to 12.25
Copper, heavy and wire.....	11.50 to 11.75
Copper, light and bottoms.....	10.75 to 11.00
Brass, heavy.....	8.00 to 8.25
Brass, light.....	6.75 to 7.00
Heavy machine composition.....	10.50 to 10.75
Composition turnings.....	8.75 to 9.00
Clean brass turnings.....	8.00 to 8.25
Lead, heavy.....	4.20 to 4.25
Lead, tea.....	3.95 to 4.00
Zinc, scrap.....	4.25 to 4.30

### St. Louis

**JUNE 19.**—The metal market in some respects shows a little more activity, especially in lead and spelter, which have developed advances in price and are continuing in good request. Tin is off, being quoted at 44.35c. as against 48.85c. last week. For antimony the figure is unchanged at 9.35c. Lake copper is 12.07½c., against 12.85c. last week, and electrolytic is 12.85c. against the same figure a week ago. The lead quotation to-day is 4.32½c. to 4.35c. and very active. In spelter the price is 5.40c. to 5.45c. and also active. In old metals the quotations are: Light brass, 5c.; heavy brass and light copper, 8c.; heavy copper and copper wire, 9c.; zinc 3c.; lead, 3.25c.; pewter, 20c.; tin foil, 30c.; tea lead, 3c.

# THE IRON AND METAL MARKETS

## Chicago

JUNE 20.—With the exception of tin, which has receded from the high point reached last week, all metals are quoted higher, with the demand fairly active. We quote Chicago prices as follows: Casting copper, 12.75c.; lake, 13.00c., in carloads, for prompt shipment; small lots,  $\frac{1}{4}$ c. to  $\frac{3}{4}$ c. higher; pig tin, carloads, 45 $\frac{1}{2}$ c.; small lots, 48 $\frac{1}{2}$ c.; lead, desilverized, 4.45c. to 4.50c. for 50-ton lots; corroding, 4.70c. to 4.75c. for 50-ton lots; in carloads, 2 $\frac{1}{2}$ c. per 100 lb. higher; spelter, 5.45c. to 5.50c.; Cookson's antimony, 10c., and other grades, 8 $\frac{3}{4}$ c. to 9 $\frac{1}{4}$ c., in small lots; sheet zinc is \$7.25 f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12 $\frac{1}{2}$ c.; copper bottoms, 10 $\frac{3}{4}$ c.; copper clips, 12c.; red brass, 10 $\frac{1}{2}$ c.; yellow brass, 9 $\frac{1}{4}$ c.; lead pipe, 4 $\frac{3}{4}$ c.; zinc, 4 $\frac{1}{4}$ c.; pewter, No. 1, 27c.; tin foil, 35c.; block tin pipe, 39c.

## Iron and Industrial Stocks

NEW YORK, JUNE 21, 1911.

The stock market has been moderately active, with firm prices and in some stocks an advancing tendency. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week follows:

Allis-Chalm., com.....	9	Pittsburgh Steel, pref....	105 $\frac{1}{2}$
Allis-Chalm., pref....	30 - 31	Pressed St., com....	36 $\frac{1}{4}$ - 37 $\frac{1}{4}$
Beth. Steel, com....	33 - 34 $\frac{1}{4}$	Pressed St., pref....	100 $\frac{1}{4}$ - 102 $\frac{3}{4}$
Beth. Steel, pref....	62 $\frac{1}{2}$ - 64 $\frac{1}{4}$	Railway Spr., com....	37 $\frac{1}{4}$ - 39
Can., com.....	11 - 11 $\frac{1}{4}$	Railway Spr., pref....	102 - 103
Can., pref.....	85 $\frac{1}{4}$ - 87 $\frac{1}{4}$	Republic, com.....	30 - 31 $\frac{1}{2}$
Car & Fdry., com....	56 $\frac{1}{2}$ - 57 $\frac{1}{4}$	Republic, pref.....	93 $\frac{3}{4}$ - 96
Car & Fdry., pref....	115 $\frac{1}{4}$ - 118	Sloss, com.....	50 - 52
Steel Foundries....	42 - 43	Pipe, pref.....	59 $\frac{3}{4}$ - 80
Colorado Fuel.....	34 $\frac{1}{4}$ - 35 $\frac{1}{4}$	U. S. Steel, com....	78 $\frac{1}{4}$ - 80
General Electric....	161 $\frac{1}{4}$ - 165 $\frac{1}{4}$	U. S. Steel, pref....	118 $\frac{1}{4}$ - 119 $\frac{1}{4}$
Gr. N. ore cert....	62 $\frac{1}{2}$ - 63 $\frac{1}{2}$	Westinghouse Elec....	74 $\frac{1}{4}$ - 77 $\frac{1}{4}$
Int. Harv., com....	120 $\frac{1}{2}$ - 123	Va. I. C. & Co....	69 - 71 $\frac{1}{4}$
Int. Harv., pref....	123 $\frac{1}{2}$ - 124 $\frac{1}{2}$	Chic. Pneu. Tool....	51 $\frac{1}{4}$ - 51 $\frac{1}{2}$
Int. Pump, com....	41 $\frac{1}{4}$ - 43	Cambria Steel.....	44 $\frac{1}{4}$ - 45 $\frac{1}{4}$
Int. Pump, pref....	90	Lake Sup. Corp....	27 - 28
Locomotive, com....	42 - 42 $\frac{3}{4}$	Warwick.....	9 $\frac{1}{4}$ - 10
Locomotive, pref....	109 - 110	Crucible St., com....	13 $\frac{1}{4}$ - 13 $\frac{1}{2}$
Nat. En. & St., com.	17 - 17 $\frac{1}{4}$	Crucible St., pref....	82 $\frac{1}{2}$ - 84

The Ohio Iron & Metal Company, iron and steel scrap, with offices in Chicago, Pittsburgh and Cleveland, will open a branch office July 1 in the Arcade building, Philadelphia, in charge of H. G. Stalnaker, for some years connected with the Pittsburgh office. The Philadelphia office will be under the jurisdiction of the Pittsburgh office, which is in charge of H. D. Stalnaker, and which also controls the Cleveland office.

## Dividends Declared.

The United Shoe Machinery Company, regular quarterly, 2 per cent. on the common and and 1 $\frac{1}{2}$  per cent. on the preferred stock, payable July 5.

The Dominion Iron & Steel Company, quarterly, 1 per cent., payable July 3.

The Canadian Westinghouse Company, regular quarterly, 1 $\frac{1}{2}$  per cent. and extra dividend  $\frac{1}{2}$  per cent., payable July 10.

The Gorham Mfg. Company, quarterly, 1 $\frac{1}{2}$  per cent., payable July 1.

The American Locomotive Company, quarterly, 1 $\frac{3}{4}$  per cent. on the preferred stock, payable July 21.

The Boston Belting Company, quarterly, \$2, payable July 1.

The Empire Steel & Iron Company, quarterly 1 per cent. on the preferred stock, payable July 1.

The McCrum-Howell Company, quarterly,  $\frac{3}{4}$  per cent. on the common stock, payable July 1.

The Garvin Machine Company, regular semi-annual, 3 $\frac{1}{2}$  per cent. on the preferred stock, payable July 1.

The Torrington Company, regular semi-annual, 3 $\frac{1}{2}$  per cent., payable July 1.

The Otis Elevator Company, regular quarterly, 1 $\frac{1}{2}$  per cent. on the preferred and 1 per cent. on the common stock, payable July 15.

The American Brake Shoe & Foundry Company, regular quarterly, 1 $\frac{3}{4}$  per cent. on the preferred and 1 $\frac{3}{4}$  per cent. on the common stock, payable June 30.

The American Locomotive Company, regular quarterly, 1 $\frac{3}{4}$  per cent. on the preferred stock, payable July 21.

The Sloss-Sheffield Steel & Iron Company, regular quarterly, 1 $\frac{3}{4}$  per cent. on the preferred stock, payable July 1.

The Yale & Towne Mfg. Company, regular quarterly, 1 $\frac{1}{2}$  per cent. and extra dividend 1 per cent., payable July 1.

## The Mining Engineers' Fall Meeting

The American Institute of Mining Engineers will hold its one hundred and first meeting in San Francisco, Cal., beginning Tuesday evening, October 10, 1901. It is expected to hold the opening session at the St. Francis Hotel, San Francisco, to be followed by other sessions on Wednesday and Thursday. Excursions have been arranged to the California oil fields and the gold dredging district on Thursday and Friday. Other excursions to be made Saturday and Sunday are for entertainment. A special train will leave Chicago September 30, for which reservations are now being made by Dr. Joseph Struthers, the secretary of the institute. An excursion to Japan will be taken at the conclusion of the San Francisco meeting. Accommodations have been secured on the Manchuria, sailing from San Francisco, October 17, stopping at Honolulu, and reaching Yokohama November 3 in time to witness the parade in honor of the emperor's birthday. The excursion in Japan, which will occupy 18 days, covers the chief points of historic, scenic and professional interest. The return trip will start from Yokohama November 21 on the Siberia, reaching San Francisco December 7.

The Carnegie Steel Company, on July 1, will take possession of the warehouse and stock of the Bassett-Presley Company, Cleveland, Ohio, and will conduct a general jobbing business from that city. For the past few months the Carnegie Company has been doing some jobbing business in the Cleveland territory, making deliveries from its Pittsburgh warehouse. The Bassett-Presley warehouse will be enlarged considerably, the Carnegie Company having acquired adjoining property for that purpose, as more room is needed for structural material, which the Bassett-Presley Company did not carry in stock. The warehouse stock of the Carnegie Company will include bars, plates, shapes, sheets and possibly other products. The Bassett-Presley Company will retain its name and will probably continue in business along other lines, although its plans have not yet been decided upon.

Dr. Joseph W. Richards, secretary American Electrochemical Society, South Bethlehem, Pa., has issued his June bulletin giving a budget of news relative to the society. He states that preparations are being actively made for the twentieth general meeting, which will be held at Toronto, Canada, September 21 to 23, and which promises to be the most important yet held by the society. Many important papers have already been offered to the committee having that matter in charge. A list of seventeen applicants elected to membership is given, comprising engineers, chemists and officers of important manufacturing interests not only in this country, but also in Canada and abroad.

The financial statement of the Crucible Steel Company of America, Pittsburgh, Pa., for the nine months ended May 31, 1911, is as follows:

Profits for quarter ended Nov. 30, 1910..	\$1,022,759.12	
Profits for quarter ended Feb. 28, 1911..	972,320.28	
Profits for quarter ended May 31, 1911..	1,078,550.08	
Total profits.....		\$3,073,629.48
Deduct for depreciation and repairs.....	\$934,340.94	
Contingencies and corporation tax.....	59,776.76	
Interest on bonds, subsidiary companies..	55,055.50	
Total deductions.....		1,049,173.20
Net profits .....		\$2,024,456.28

The Armor Steel Foundry Company announces that, having purchased the property and equipment of the Steel Foundry Company, Winton Place, Cincinnati, it will make that its principal works and general office in the future. A large amount of new equipment has been installed, placing the plant in a position to increase materially its output and to shorten time of deliveries. The inclusion on its staff of a competent chemist and metallurgist of long experience and high standing will enable the company to engage successfully in the manufacture of nickel, chrome, vanadium, titanium and Gebhart process of steel castings. All improvements and additions are expected to be completed by July 15, and to be in operation by that time.



## Personal

President James A. Ferrell, of the United States Steel Corporation, will sail for Europe next Tuesday, but will make only a short stay, expecting to be in New York again July 14.

Chairman E. H. Gary, of the United States Steel Corporation, sailed for Europe on Wednesday.

Herman Schneider, dean of the School of Engineering, University of Cincinnati, has been given an honorary degree of doctor of science by the University of Pennsylvania. The degree was in recognition of Dean Schneider's services to American education in founding the co-operative system of college work.

H. J. Freyn, formerly with the Illinois Steel Company, South Works, South Chicago, Ill., has accepted a position with the Allis-Chalmers Company, Milwaukee, Wis.

William W. Manville, president, and Trane F. Manville, secretary, have disposed of their interests in the Manville Brothers Company, wire and metal working machinery, Waterbury, Conn., severing their connection with that corporation.

William P. Cooper, formerly vice-president of the Riverdale Iron and Steel Company, Riverdale, Ill., will on July 1 become associated with the Joliet Rolling Mill Company, Joliet, Ill., as mechanical engineer, in full charge of tests and demonstrations of its Arrow brand iron, in which he will be assisted by district sales offices throughout the United States. For many years Mr. Cooper was associated with the Brown-Bonnell Works, Youngstown, Ohio, and has expert knowledge of high-grade irons, both as regards their manufacture and the method of using them.

S. Rosenzweig, who, as personal representative of Hugo Lentz, of Berlin, Germany, went to the Erie City Iron Works, Erie, Pa., a few years ago to act as its consulting engineer, while introducing the Lentz poppet valve engine in this country, has moved to 1539 First National Bank Building, Chicago, where he is connected with the office of the Erie City Iron Works.

George Braithwaite, Sr., factory manager of the Stevens-Duryea Company, Chicopee Falls, Mass., has resigned to take a similar position with the Thomas Jeffrey Company, Kenosha, Wis., manufacturer of the Rambler automobile. Mr. Braithwaite is also associated with the Central Autogenous Welding Company, Worcester, Mass.

F. A. Ogden, general freight agent of the Jones & Laughlin Steel Company, Pittsburgh, has been elected president of the Traffic Club of Pittsburgh.

H. D. Evans, of the H. D. Evans Steel Company, 127 Oliver street, Boston, Mass., has bought a controlling interest in the Simplex Tool & Supply Company and is now in charge of the company's business, which he conducts as a side line.

John I. Rogers, engineer, whose specialties are forging plants, machine shops, power plants, furnaces and steel works, 165 Broadway, New York, has opened a branch office at 929 Chestnut street, Philadelphia.

Charles Bond, president of the Charles Bond Company, mill supplies, Philadelphia, Pa., and president of the Manheim Belting & Mfg. Company, Manheim, Pa., has sailed for a three months' trip abroad.

August Marx, general manager of the Philadelphia Roll & Machine Co., Philadelphia, Pa., will take a three months' vacation in the Adirondacks for the benefit of his health.

J. A. Hagar, formerly vice-president of the Western Iron & Supply Company and afterward with the Scully Steel & Iron Company of Chicago as its Southern representative, has opened an office in the Wainwright Building, Seventh and Chestnut streets, St. Louis, Mo., and will handle a line of iron and steel products.

The Pittsburgh Emery Wheel Company, with plant at Rochester, Pa., and general offices in Pittsburgh, has appointed M. E. White as its sales representative in the Pittsburgh district, while Frank Lewis handles its sales in the Lake district from the Hippodrome Building, Cleveland, Ohio.

The property of the Russ Mfg. Company, Oil City, Pa., will be offered at public sale by the receiver, A. R. Smart, July 6, at 2 p. m. The equipment includes one 50 and one 100-hp. boiler, one Skinner engine, two electric motors, pumps, fans, grinding machines, etc., used in the manufacture of gelatine.

The Knox Pressed & Welded Steel Company, Fulton Building, Pittsburgh, which has recently taken over the plant formerly operated by the Niles Boiler Works, Niles, Ohio, has contracted with the United Engineering & Foundry Company, Pittsburgh, for a 200-ton hydraulic press, to be delivered early next month, and with the Sawers Mfg. Company, Buffalo, N. Y., for a Lavoisite oxyacetylene welding plant with 24 torches.

S. N. Craig, vice-president of the Treadwell Construction Company, Midland, Pa., has gone to Los Angeles, Cal., on business.

J. B. Andrews, a member of the Andrews Steel Company and Newport Rolling Mill Company, Newport, Ky., was operated on for appendicitis last week, and is now reported to be recovering rapidly.

Alonzo Pawling, Pawling & Harnischfeger Company, crane builder, Milwaukee, Wis., has returned from a three months' automobile tour of the Southwest. The itinerary covered Arizona, southern California and Old and New Mexico.

Theodore H. Curtis, superintendent of machinery of the Louisville & Nashville Railroad Company, Louisville, Ky., has resigned, effective July 1. He will devote his time to perfecting several railroad appliances which he has invented. C. F. Giles, his assistant, has been appointed his successor.

## Obituary

JOSEPH B. REED, proprietor of the Cairo Iron & Machine Works, Cairo, Ill., died June 14, aged 80 years. He had been engaged in the foundry and machine business for over 55 years. Born in New England, he went to St. Louis before the Civil War and embarked in business in that city. Later he moved to Cairo, a city of growing commercial importance and at that time a strategical point during the war, where he engaged in the manufacture of ironworking machinery for railroads, mills and general machine shop use. In connection with his shops he was also a jobber in heavy hardware and mill supplies. During the Civil War he built the first 18 or 20 tugboats which the United States Government used on the Mississippi River and some of its tributaries. He leaves a widow, two sons and two daughters.

WILLIAM W. LEE, Northampton, Mass., secretary and manager of the Clement Mfg. Company, Northampton, Mass., died June 14, aged 60 years. He was a native of Boston and had lived in Northampton 30 years, during most of which time he had been manager of the Clement factory. Previously he was with the Haydenville Brass Company, Haydenville, Mass. He leaves a widow, a son and a daughter.

**Geo. W. Jackson's Fabricating Plant to Be Sold.**—The affairs of Geo. W. Jackson, Inc., Chicago, have been in the hands of a creditors' committee for some time. This committee undertook the completion of the company's existing contracts, but no new contracts were undertaken or sought. The excellently equipped fabricating plant has been practically shut down and is now offered for sale. Other office-building and warehouse property of the company recently changed hands, and apparently partial liquidation rather than reorganization has been found desirable. The steel plant, which is now available for purchase, was extensively enlarged and completed within the past year, and is equipped with unusual advantages for the fabrication of both large and small steel work. It has a total capacity of approximately 70,000 tons of work annually.

The Connors-Weyman Steel Company, Helena, Ala., has resumed operations and is rolling cotton ties and other specialties. The sales offices of this company are in the Brown-Marx Building, Birmingham.

## Judicial Decisions of Interest to Manufacturers

ABSTRACTED BY A. L. H. STREET

**Acceptance of Orders.**—A letter acknowledging receipt of an order for machinery and stating that it will have "best attention" does not constitute a binding acceptance of the order. (New York Supreme Court, Third Appellate Division; Van Keuren vs. Boomer & Boschert Press Company; 128 New York Supplement 306.)

**Machinery as Part of Real Estate.**—Engines, boilers, machinery, etc., contained in a factory are subject to lien under a judgment against the land and will not be treated as separate chattels, though they were acquired by the owner separately from the building. (United States District Court, Eastern District of Pennsylvania; in re Berg; 184 Federal Reporter 522.)

**Implied Warranty of Articles Specially Manufactured for Sale.**—One who manufactures a special article for sale impliedly warrants that it is fit for the purpose for which it is made and bought; but, where the seller of a thing is not the manufacturer and the buyer has an opportunity to inspect it, there is no implied warranty, in the absence of fraud. (Maryland Court of Appeals; Commercial Realty & Construction Company vs. Dorsey, 78 Atlantic Reporter 1099.)

**Rights Concerning Geographical and Descriptive Words Used as Trademarks and Trade Names.**—A geographical or descriptive word is not subject to appropriation as a trademark or a trade name, but its use may be restrained on the ground of unfair competition where confusion in the minds of customers results to the prejudice of one first adopting it. (St. Louis Court of Appeals; A. J. Reach Company vs. Simmons Hardware Company, 135 Southwestern Reporter 503.)

**Validity of Conditional Sale Contract.**—The Ohio statute which makes a conditional sale contract void as against the buyer's creditors unless it is in writing and recorded cannot be avoided by placing a plate on the article sold showing that it is the property of the seller. (United States Circuit Court of Appeals, Sixth Circuit; Cincinnati Equipment Company vs. Degnan, 184 Federal Reporter 834.)

**Right to Rescind Contract.**—When a contract has been partly performed, and one of the parties has derived substantial benefits, or has imposed upon the other material losses through the latter's partial performance of the agreement, then the first party cannot rescind the contract on account of the second party's failure to complete his performance. The agreement must stand; the first party must perform his part of it, and his only remedy for the failure of the second party to completely perform is compensation in damages for the breach. (United States District Court, Northern District of West Virginia; in re Morgantown Tin Plate Company; 184 Federal Reporter 109.)

**Remedy of Seller on Breach by Buyer.**—When a buyer of an article specially manufactured for him refuses to accept it, after it is ready for delivery, the seller may treat it as the buyer's property, holding it subject to the buyer's order, and sue for the contract price. (St. Louis Court of Appeals; Koenig vs. Truscott Boat Mfg. Company, 135 Southwestern Reporter 514.)

**Essentials to Enforceable Contract.**—A contract of sale is not enforceable until the price is agreed upon. A qualified acceptance of an offer does not form a binding contract until the qualification is accepted by the party who made the original offer. (Arkansas Supreme Court; D. S. Cage & Co. vs. Black, 134 Southwestern Reporter 942.)

**Burden of Proof on Employee Suing for Injury.**—An employee suing for injury caused by the defective condition of a machine has the burden of establishing that the employer knew, or by proper inspection should have known, of the defects. (Pennsylvania Supreme Court; Burt vs. Jessup Steel Company 79 Atlantic Reporter 121.)

**Liability for Injury Resulting from Unusual Accident.**—A steel company is not liable for death of a workman resulting from an accident of a character not known to have occurred before and of an unknown cause. (United States Circuit Court of Appeals, Seventh Circuit; McCash vs. Commonwealth Steel Company, 184 Federal Reporter 882.)

**Liability for Injury to Minor Employed in Violation of Law.**—Violation of a statute limiting the right to employ children between the ages of 14 and 16 does not authorize recovery for injury to such a child while so employed, in the absence of a showing that violation of the statute was the direct cause of the injury. (United States Circuit Court of Appeals, Seventh Circuit; Chee vs. Steel Car Forge Company, 184 Federal Reporter 868.)

**Duty to Warn Molder's Helper.**—An employer owes a duty to instruct an inexperienced foundry molder's helper of the danger of an explosion following the mixing of molten metal with water. (Michigan Supreme Court; Borkowski vs. American Radiator Company, 130 Northwestern Reporter 640.)

**Liability for Injury Caused by Foreign Laborers.**—That laborers directed to move a boiler front were ignorant of the English language does not show negligence in their employment, making the employer liable for injury to an employee caused by the laborers negligently permitting the front to fall, since the accident must have resulted from their stupidity or malice, rather than ignorance of language. (Michigan Supreme Court; Rigge vs. Wickes Brothers, 130 Northwestern Reporter 683.)

**Duty to Warn Minor Employees.**—An employer must explain to a minor employee such hazards of the employment as are known, or in the exercise of ordinary care ought to be known, to the employer, where the employee cannot reasonably be expected to appreciate the dangers. \* \* \* The doctrine that an employee cannot recover, when he receives an injury which has been brought about by his own willful violation of rules laid down by the employer for the safety of his workmen, does not preclude recovery by a workman who violates an instruction given him only for his guidance in carrying on the work, and without knowledge of any danger involved in its violation. (New Jersey Court of Errors and Appeals; Horandt vs. Rosenthal, 79 Atlantic Reporter 321.)

**Risks of Injury Assumed by Employees.**—The rule that an employee assumes the risk of injuries arising from the employment presupposes that the employer has performed the duties of care devolving upon him. It is those risks alone which cannot be obviated by the adoption of reasonable measures of precaution by the employer that the workman assumes. (New Jersey Court of Errors and Appeals; Pakusewski vs. Ringwood Company, 79 Atlantic Reporter 319.)

**Liability for Injury to Workman Resulting from Defect Known to Foreman.**—An employer is liable to a machinist for injury resulting from a defective condition of a lathe tool known to the foreman. (Massachusetts Supreme Judicial Court; Hines vs. Waltham Mfg. Company, 94 Northeastern Reporter 464.)

**Liability for Injury to Employee Caused by Defective Appliances.**—An employer is not liable for injury to a workman merely because some part of an appliance has become out of order. It must have been out of order long enough to charge him with negligence in failing to discover it by proper inspection. While the happening of the accident may suggest the existence of a defect, it does not, in itself, give rise to a presumption of negligence in failing to discover the defect seasonably. (New York Supreme Court, Second Appellate Division; Schlappendorf vs. American Railway Traffic Company; 127 New York Supplement 44.)

**Right of Employee to Recover Damages for Wrongful Discharge.**—One cannot recover substantial damages for wrongful discharge under a contract of employment for a definite term unless he shows what he has earned since the discharge and what efforts he has made to secure similar employment. (New York City Court; Charles Gottlieb & Co. vs. Coutant, 127 New York Supplement 250.)

**Proof Required in Action for Death of Employee.**—One suing for death of an employee on the ground of negligence by the employer must prove that the death was directly caused by the injuries received. This burden was not sustained in this case by a physician testifying to fact shown by hospital records not shown to be correct. (New York Supreme Court, First Appellate Division; Levy vs. J. L. Mott Iron Works, 127 New York Supplement 506.)

**Employer's Duty to Provide Safe Place of Work.**—An employer cannot avoid his duty to provide a safe place of work for his employees by delegating performance of it to certain other employees. If the deck of a vessel upon which a laborer was required to carry iron bars was slippery on account of having been recently painted, making it unsafe for him, the employer was bound to warn him against the danger, especially if the slippery condition was not obvious. (Michigan Supreme Court; Orso vs. Great Lakes Engineering Works, 129 Northwestern Reporter 673.)

**Liability for Injury to Workmen in Carrying Heavy Object.**—An employer who misrepresents the weight of an object, such as a heavy piece of iron, to induce a squad of workmen to carry it, is liable for injury to one of them, caused by it falling through their inability to hold it, if the employer has actual or constructive knowledge as to the weight. (Georgia Court of Appeals; Beard vs. Georgia Mfg. Company, 70 South-eastern Reporter 57.)



## Foundry Coke

### Proposed Standard Methods for Determining Its Constituents

A proposed standard method for determining the constituents of foundry coke was reported to the American Foundrymen's Association, at Pittsburgh, by H. E. Diller, secretary of the committee, as follows:

As to sampling, each carload of coke shall be considered as a unit. While the car is being unloaded, full length pieces of coke shall be taken at about equal intervals and a sample approximately the size of an egg taken from each end and also from the middle of each piece, until 25 to 40 lb. are obtained. Should it be necessary to sample from a stock pile, 25 to 30 lb. of sample, obtained as above directed, shall be taken for each 50 tons in the pile, care being used to get the piece from different places which will give a fair average sample.

**Preparing the Sample.**—Crush the sample between hardened surfaces, preferably of manganese or chrome steel, until all the material passes through a  $\frac{1}{2}$ -in. mesh sieve. Quarter this; reserve one portion for moisture determination and crush the other portion until it will all pass through a  $\frac{1}{4}$ -in. mesh sieve, and again quarter down until about 2 lb. remain. Crush this until it will pass a No. 20 mesh sieve, and quarter down to about 20 g. Grind this until it all passes through a No. 100 mesh sieve.

**Moisture.**—Dry 1 kg. of  $\frac{1}{2}$ -in. mesh sample to constant weight at 104 deg. to 107 deg. C. The loss in weight shall be calculated to per cent. moisture. Moisture shall be determined on the ground sample by getting the loss in weight when 1-g. sample is heated in an open platinum crucible of about 20-c.c. capacity for 1 hr. at 104 deg. to 107 deg. C. The moisture on the ground sample shall be used to calculate the other results got from the ground sample to percentages in the coarse undried sample.

**Volatile Matter.**—Cover the crucible containing the dried sample, with another crucible (either platinum or porcelain) of such a size that it will fit closely to the sides of the outer crucible, and its bottom will rest  $\frac{1}{3}$  to  $\frac{1}{2}$ -in. above the bottom of the outer crucible. Ignite  $3\frac{1}{2}$  min. with the Bunsen burner and  $3\frac{1}{2}$  min. with the blast lamp. Let cool, remove the inner crucible and reweigh the outer crucible with contents. The loss of weight is volatile matter.

**Ash and Fixed Carbon.**—Ignite the sample upon which the volatile matter was determined until all the carbon is burned, having the crucible open and inclined. The ash should be tested for unburned carbon by moistening it with alcohol, which will show black any carbon remaining. After all carbon is burned, the weight of the crucible and ash minus the weight of the crucible, gives the amount of ash in the sample. The amount of fixed carbon is obtained by subtracting the weight of the crucible and ash from the weight of the crucible and residue from the volatile matter determinations.

#### Testing for Sulphur

The apparatus for testing for sulphur includes a soft steel or nickel crucible of about 40-c.c. capacity, the lid being perforated with a small hole for the introduction of the igniting wire. Any arrangement suitable for holding the crucible firmly in place and out of contact with the beaker during the peroxide combustion will serve for a crucible stand.

To the dry crucible add first 12 g. of sodium peroxide and 0.5 g. of powdered potassium chlorate, then exactly 0.7 g. of coke (80 mesh) and mix thoroughly by means of a small spatula. Place the covered crucible on its stand in a 20-oz. beaker containing enough water to immerse the lower half of the crucible.

Ignite the crucible contents by thrusting in, for a moment, a red-hot wire through the lid hole. Wait 2 min. or longer for the mass to cool somewhat, remove the stand and tip over the crucible on its side in the water. After the fusion dissolves, rinse and remove the crucible.

Acidify the solution with hydrochloric acid, then add ammonia in slight excess, filter and wash. To the filtrate add a drop of methyl orange, then hydrochloric acid from a graduated pipette or burette until 0.5 c.c. in excess. Bring to boiling, add dropwise about 10 c.c. of barium

chloride solution, continue boiling at least 15 min. longer, and allow it to stand in a warm place for not less than 2 hr., filter, wash until the silver nitrate test shows no chlorides, ignite and weigh as  $\text{BaSO}_4$ .

$$\text{Grams } \text{BaSO}_4 \times 19.6 = \% \text{ Sulphur.}$$

#### Testing for Phosphorus

Ignite 5 g. of coke in a platinum dish or large platinum crucible until all the carbon is burned off, then add 10 c.c. hydrochloric acid (1-1) and 20 c.c. hydrofluoric acid and evaporate to dryness and ignite at a dull red heat. Fuse the residue with about  $1\frac{1}{2}$  g. of sodium carbonate and 2 g. of potassium nitrate. Cool, place the dish in a beaker of water and boil. Clean and remove the dish. Acidify the solution with hydrochloric acid, precipitate with ammonia, boil, filter and wash with hot water. Wash the filter with warm dilute nitric acid to dissolve the precipitate. Should it not dissolve, wash with warm dilute hydrochloric acid until dissolved. In the latter case it will be necessary to evaporate to about 5 c.c., add 30 c.c. nitric acid (1.20 sp. gr.), again evaporate to about 5 c.c., and add 30 c.c. nitric acid (1.20 sp. gr.). After heating the solution to between 70 and 90 deg. C., add 50 c.c. of molybdate solution. Agitate the solution a few minutes, then filter, and wash 5 times with a 3 per cent. nitric acid solution, and 5 times with a 0.1 per cent. potassium nitrate solution. Transfer the precipitate and filter to the flask in which the precipitate was made. Add 30 c.c. water, then Na OH (N-5) from a burette until in excess, keeping the solution agitated. When the yellow precipitate is all dissolved add 0.1 c.c. of phenolphthalein solution as indicator, and then titrate with  $\text{H}_2\text{SO}_4$  (N-5).

$$\text{c.c. (N-5) NaOH} - \text{c.c. (N-5) H}_2\text{SO}_4 \times .0054 = \% \text{ Phosphorus}$$

To make the molybdate solution, add 100 g. molybdic acid to 250 c.c. water, and to this add 150 c.c. ammonia. Stir until all is dissolved and add 65 c.c. nitric acid (1.42 sp. gr.). Make another solution by adding 400 c.c. concentrated nitric acid to 1100 c.c. water, and when the solutions are cool, pour the first slowly into the second with constant stirring and add a couple of drops of ammonium phosphate.

**A 35-Ton Electric Locomotive.**—An order has been recently placed with the General Electric Company, Schenectady, N. Y., by the Woodward Iron Company, Woodward, Ala., for a 35-ton locomotive which will be used for hauling coke from the by-product ovens to the point where it is dumped into gondolas for transportation to the blast furnaces. This locomotive will make about 50 round trips per day, each of which is about 2000 ft. long, and will handle approximately 20 tons of coke per trip. The locomotive is designed along the lines of the builder's standard practice with all-steel framing and an arch bar truck. It is designed for slow speed service and is equipped with four 220-volt motors and the type M single unit control. In this control there are six steps, two with the motors in series and the other four with all of them in parallel.

The length of stroke in gasoline engines was briefly discussed before the Society of Automobile Engineers at its meeting in Dayton, Ohio, June 15 to 17, by Justus B. Entz. On the basis of piston displacement a  $4\frac{1}{2} \times 4\frac{1}{2}$ -in. and a  $4 \times 5\frac{3}{4}$ -in. engine will give equal power, but the shorter stroke engine must have a greater pressure on the piston head by 26 per cent., and losses in bearings will consequently be greater. The result is a higher mechanical efficiency for the long stroke. The author believes engines with a stroke relation to bore of 1.4 to 1.5 are lighter, more efficient and more flexible than shorter stroke engines.

The Van Ormer-Lose Wrench Company, a recently incorporated Pennsylvania company, has secured a site at Trafford City, Pa., and is erecting a new manufacturing plant. The building is of brick construction set on concrete piers and is to be equipped with motors and a line of machine tools, such as drills, grinders and other finishing machinery, for the manufacture of a new patented quickly adjustable wrench for which L. G. Van Ormer has secured a patent. The factory will be ready for operation about the middle of August.

The Duquesne Steel Foundry Company, Pittsburgh, Pa., has increased its capital stock to \$1,200,000.

# Forty Years' Progress in Pig Iron

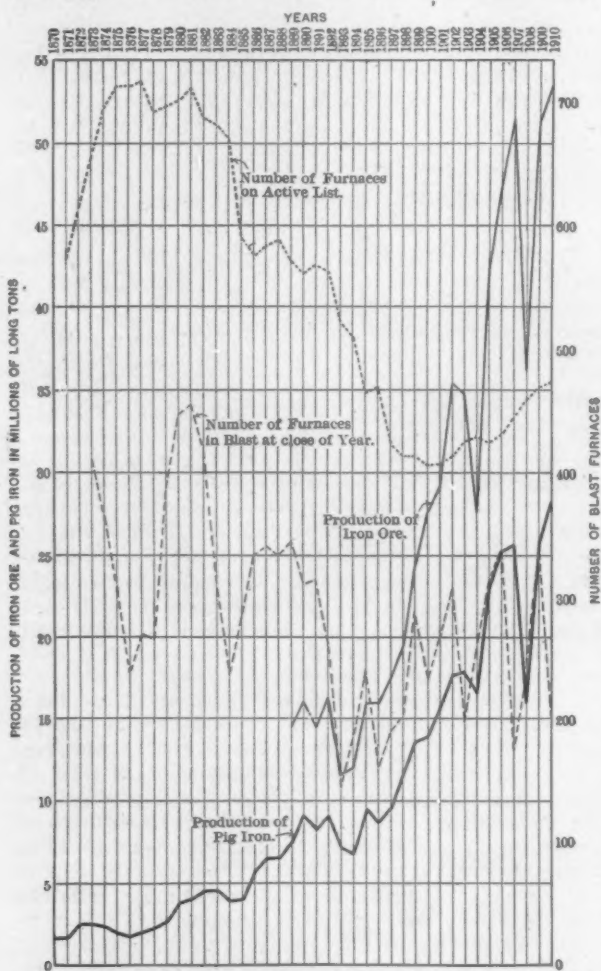
The Production of Pig Iron in the United States from 1871 to 1910\*

BY JOHN BIRKINBINE, PHILADELPHIA, PA.

The practical coincidence of the fortieth anniversary and the one hundredth technical meeting of the American Institute of Mining Engineers offers temptation to recall and compare the conditions of mining and metallurgy in or about the years 1871 and 1911. Since such a résumé would necessitate an extended paper, the record of the pig-iron industry is here selected as indicative of the progress to which members of the institute have been important contributors.

## The Increase in Iron Ore Smelted Per Year

It is not necessary to discuss here the details of conversion, manipulation, and utilization of the metal. The simple story of the amount of iron ore smelted to produce pig iron between 1870 and 1910 constitutes a suffi-



Record of the Iron Industry of the United States from 1870 to 1910.

cient gauge of this phenomenal advance; and the fact that in 1871 iron rails commanded \$70 and steel rails \$102 per ton, while in 1910 no iron rails were produced, and the price of steel rails was \$28 per ton, epitomizes the change of conditions.

The ninth census gave the consumption of iron ore in the United States for the year 1870 as 3,831,891 and the production of pig iron as 1,665,179 gross tons. At that time Pennsylvania headed the list of states, with fully one-third of the iron ore won; but later, Michigan, and subsequently Minnesota, took the lead, the record for 1909 being: Minnesota, 28,975,149; Michigan, 11,900,384, and Pennsylvania, 666,889 gross tons the estimated production of iron ore in the United States in 1910 being 53,500,000 tons.

For 17 years before 1871 the Marquette range in Michigan had been shipping mineral; but the entire output of

1871 (813,379 gross tons) was less than the storage capacity in 1910 of the 6918 pockets in the 29 shipping docks on the Great Lakes, through which, in that year, 42,619,060 tons of iron ore were loaded into vessels; and the total production of this range for 17 years was less than the output in 1909.

Iron ores from the Marquette range of Michigan (the only producing section of the Lake Superior region) were then (1871) principally used to mix with other ores; and the various sources from which ores were assembled at blast furnaces, about the time of the organization of the institute, are suggested by the record that in 1873 11 furnaces in Pittsburgh and vicinity produced 141,773 gross tons of pig iron, and were supplied with ore from the following localities:

	Gross tons.
By rail Lake Superior ores.....	202,840
By rail Lake Champlain ores.....	3,440
By rail Iron Mountain, Mo., ores.....	24,580
By river Iron Mountain, Mo., ores.....	88,489
Native local ores (mostly carbonates).....	1,492
Total .....	320,841

In 1910, on the other hand, 47 blast furnaces in the Pittsburgh district produced 5,330,898 gross tons of pig iron from 10,000,000 tons of ore brought from the Lake Superior region, practically a ten-fold increase per furnace, and a total district output augmented 30 times.

## Improvement in Furnace Construction

When the handful of men who, recognizing the advantage of mutual help and interchange of knowledge, assembled in Wilkes-Barre in May, 1871, to organize the institute, the predominant blast-furnace structure was a truncated square pyramid of stone masonry, lined with refractory brick or stone, the crucible often being formed of stone neatly dressed to shape. From the throats of many furnaces the hot gases, meeting the air, became flame, pulsating with the action of the blast apparatus and illuminating the surrounding country. Some of the newer furnace stacks, however, were cylindrical shafts of brick, held by bands or shells of metal and supported on masonry piers or metal columns, the top being closed with bell and hopper.

An output of 30 tons per day was considered satisfactory for an average furnace, and the weekly production of 300 tons was sufficient to excite comment. In 1878 the record of 100 tons of pig metal produced by a single blast furnace in a day startled metallurgists throughout the world. Closed fronts were a new feature. As a rule, the fluid metal and cinder accumulated in a fore-hearth, the latter overflowing from under a removable plate, and furnaces were "worked" periodically to remove accumulations of unconsumed fuel, ash and dirt.

Railroad cars of from 5 to 10 tons capacity delivered the raw material to the more important plants, although some depended largely upon canal transportation, and many charcoal furnaces relied solely upon wagon haul for raw material and product.

The organization of our institute occurred at the time when the manufacture of iron was in a state of transition, when the older constructions were being displaced by those of newer design and the theory of smelting was being scientifically investigated. The situation was epitomized by E. C. Pechin, who said, in a paper on "The Position of the American Iron Manufacture," read at the Pittsburgh meeting of October, 1872:

The time has come when scientific research is to assume its true position. The day of "sheer force and blind stupidity," whose only protection was a high tariff, has gone by forever. The prodigal waste of the rich gifts of nature; the vast sums of money thrown away; the hard labor, in the aggregate too large to be even approximately estimated, which has been uselessly expended; the mishaps, drawbacks, and failures which have followed every step of our business, show most conclusively that the physicist, the geologist and mineralogist, the chemist, the engineer and mechanic are as essential to success as the furnace itself, or the labor that works it. . . . Eternal vigilance is the price of pig iron.

In the period under contemplation there have been radical changes in the shape and proportions, equipment, appliances and location of blast furnaces. The low flat

\*Abstract of paper presented to the American Institute of Mining Engineers, Wilkes-Barre meeting, June, 1911.



bosh and narrow crucible were gradually changed, until the "no bosh" furnace was suggested; and subsequently the very steep slope of boshes gave place to large hearth and moderately flat boshes. The height of furnace, which became excessive, exceeding 100 ft., has settled down to more moderate dimensions. The number and size of tuyeres were augmented and economical blowing apparatus was designed to meet the greater demands of volume and pressure. The removal of ore dust and coke dust from blast furnace gases and the cleansing and utilization of these, together with the recovery of the mineral-producing dust, and the employment of gas for operating blowing machinery and other purposes, as well as the conversion of cinder into cement, and the use of gas from by-product ovens, deserve attention in this connection.

Much of the ore is now never touched by the miner, shipper, laborer or furnaceman from the time it leaves its natural bed until, with corresponding quantities of flux and fuel, it enters into the charge of the modern blast furnace, the product of which averages 10 times that of the larger furnaces in 1871. Indeed, a considerable portion of the iron ores now smelted are not touched by the hand of man until, after passing through the blast furnace, being handled by ladle cars in a molten state to casting machines, mixers and converting plants and mills, they become finished merchantable products.

To illustrate graphically the changes in our pig-iron industry during the last 40 years, the accompanying diagram has been prepared, in which the ordinates represent years, and the abscissa show on the right the number of blast furnaces and on the left the production of domestic iron ore and pig iron in millions of tons. The upper curve indicates the number of blast furnaces reported as active or ready for operation in each year; but it should be remarked that the unwillingness of owners to report a plant as abandoned makes this number greater than the facts really warrant. While the lower curve shows the number of furnaces in blast at the end of each year, the true condition would in most cases be between the two curves. The decrease in the number of furnaces and the coincident increase in the annual production of pig iron are thus illustrated.

The production of domestic iron ore and pig iron show approximately the relations which the raw material bore to the product, but to the quantity of ore should be added mill cinder, scale, etc., and imported iron ore, the latter ranging from 180 to more than 2,000,000 tons per year.

To assist in studying this diagram the figures and quantities are given in the subjoined table.

Total Number of Blast Furnaces in the United States on December 31, of the Following Years, with Domestic Production of Pig Iron and Iron Ore.

Year.	Number of existing blast furnaces.	In blast at close of year.	Quantity of pig iron produced. Tons.	Quantity of domestic iron ore produced. Tons.
1870	no record	no record	1,665,179	3,831,891
1871	571	no record	1,706,793	
1872	612	no record	2,548,713	no record
1873	657	410	2,560,963	no record
1874	693	365	2,401,262	no record
1875	713	293	2,023,733	no record
1876	712	236	1,868,961	no record
1877	716	270	2,066,594	no record
1878	692	265	2,301,215	no record
1879	697	388	2,741,853	no record
1880	701	446	3,835,191	7,120,362
1881	716	455	4,144,254	
1882	687	417	4,623,323	
1883	683	307	4,595,510	
1884	669	236	4,097,868	
1885	591	276	4,044,526	
1886	577	331	5,683,329	
1887	583	339	6,417,148	
1888	589	332	6,489,738	
1889	570	344	7,603,642	14,518,041
1890	562	311	9,202,703	16,036,043
1891	569	313	8,275,870	14,591,178
1892	564	253	9,157,000	16,296,666
1893	521	137	7,124,502	11,587,629
1894	511	185	6,657,388	11,879,679
1895	468	242	9,446,308	15,957,614
1896	470	159	8,623,127	16,005,449
1897	423	191	9,652,680	17,518,046
1898	414	202	11,773,934	19,433,716
1899	414	289	13,620,703	24,683,173
1900	406	232	13,789,242	27,553,161
1901	406	266	15,878,354	28,887,479
1902	412	307	17,821,307	35,554,135
1903	425	182	18,009,252	35,019,308
1904	429	261	16,497,033	27,644,330
1905	424	313	22,992,380	47,526,133
1906	429	340	25,307,191	47,749,728
1907	443	167	25,781,361	51,720,619
1908	459	236	15,936,018	35,983,336
1909	469	338	25,795,471	51,294,271
1910	473	206	27,298,545	(est.) 53,500,000

The number of blast furnaces and production of pig iron are copied from the reports of the American Iron

and Steel Association, and the iron ore data are mainly from the statistical reports of the United States Geological Survey. The figures for 1870 and 1880 for the production of iron ore are taken from the census.

### Mount Savage Firebrick Plant to Enlarge

At the annual meeting of the Union Mining Company, proprietor of the Mount Savage Firebrick Works, Mount Savage, Md., which was held in the company's general offices in the Fidelity Building, Baltimore, Md., June 6, President H. Crawford Black reported that to handle promptly the large volume of orders being received it has become necessary, for the second time in a period of six years, to increase the capacity of the works. A committee spent practically the entire month of May investigating the merits of the various modern methods and machinery that could be used in the manufacture of high-grade firebrick and visited many of the largest firebrick operations in the East and West. The new extension then decided upon is now under construction and when completed the Mount Savage plant will have a capacity of 100,000 9-in. brick per day. It is not proposed, however, to operate the entire plant on standard brick and shapes exclusively. A large portion of it will be devoted to the department having in charge the manufacture of special and difficult shapes used in the iron, steel and allied trades, lime and cement industries, water gas linings, gas bench settings, etc. Before the new construction work was decided upon, the company spent considerable money prospecting and boring with diamond drills its large holdings of clay lands, the result being an assurance of sufficient Mount Savage flint and plastic clays to last for centuries.

The E. J. Longyear Company has been incorporated and will take over the interests of E. J. Longyear, Hibbing, Minn., and Longyear & Hodge, Marquette, Mich., commencing business July 1 at its main offices, 710 to 722 Security Bank Building, Minneapolis, Minn. Branches will be maintained at Hibbing, Duluth and Brainerd, Minn.; Marquette and Crystal Falls, Mich.; Birmingham, Ala., and Vancouver, B. C. Edmund J. Longyear will be president and Frank G. Jewett and John E. Hodge, vice-presidents. The company makes contracts for diamond drilling and will examine and report on mineral lands, while in its mechanical department it will continue the manufacture of diamond drills and supplies in the plant recently constructed in Marquette by Longyear & Hodge, which will remain under the management of Frederick F. Fredlund.

The fortnightly statement of the American Railway Association for the period ended with June 7 showed a slight improvement in the movement of traffic. On May 24 there was a net surplus of freight cars of all types of 167,398 on the lines of railroads in the United States and Canada. Two weeks later this total had been reduced to 166,802, a decrease of 596 cars. This is the smallest number of cars not in use since the statement of February 1. The real turning point in the idle car situation has about been reached. With the approach of the crop-moving season the demand for box cars picks up quickly and the total number of idle cars will soon reflect the effect of this periodic movement.

In the month of May the Dominion Steel Corporation's plant at Sydney, N. S., turned out 23,450 tons of pig iron, 28,510 tons of steel ingots, 25,437 tons of blooms, 15,922 tons of rails and 8000 tons of rods.

The Union Spring & Mfg. Company has moved its offices from the Farmers' Bank Building to the Oliver Building, Pittsburgh.

The output of the Transvaal, Africa, gold mines for May exceeded all records, being 685,951 ounces, with a value of £2,913,734, or about \$15,000,000.

R. B. Murray, Farmers' Bank Building, Pittsburgh, representative of the Titusville Iron Works, has sold to the United States Government a 100-hp. boiler to be placed on a dredge boat on the Ohio River, and a 300-hp. water-tube boiler and a 250-hp. Fitchburg engine to the Pittsburgh-Hickman Company, Butler, Pa.

## Atlantic City Railway Convention Exhibits

A notable feature of the conventions of the Railway Master Mechanics' Association and the Railway Master Car Builders' Association, which were opened at Atlantic City, N. J., June 14 and concluded June 21, were the exhibits of metal working machinery and car and track appliances. As a show calculated to interest machine shop managers the exhibition was the most complete attached to any convention ever held in this country. The exhibits occupied 76,453 sq. ft. on the Million Dollar Pier, and there was an overflow of exhibitors who secured space near it. There were about 260 booths, and the variety of mechanical equipment and shop appliances shown was decidedly comprehensive, as is illustrated by the following partial list of exhibits.

- Ajax Mfg. Company, Cleveland, Ohio.—Machine made forgings.
- American Brake Shoe & Foundry Company, Mahwah, N. J.—Locomotive driver brake shoes, flanged brake shoes for steel tired and rolled steel wheels, unflanged brake shoes for cast iron wheels, combination driver brake heads and reinforcing parts which go with these shoes.
- American Locomotive Company, New York, N. Y.—Reception booth with photographs of locomotives.
- American Steel Foundries, New York, N. Y.—Andrews side frames, cast steel bolsters, Simplex bolsters, brake beams, Davis cast steel wheels, Simplex couplers, Susemihl roller side bearings, springs and miscellaneous castings.
- American Tool Works Company, Cincinnati, Ohio.—Motor driven 24-in. high duty engine lathe, 24-in. back geared crank shaper, 3-ft. back geared radial and 6-ft. triple-gear plain radial.
- American Vanadium Company, Pittsburgh, Pa.—Vanadium ores and alloys. Vanadium steels. Vanadium cast iron. Locomotive parts. Vanadium machinery steels. Vanadium high speed tool steels.
- Anchor Packing Company, Philadelphia, Pa.—Fibre packing and mechanical rubber goods. Tauril sheet packing, throttle and air pump packing.
- Armstrong-Blum Mfg. Company, Chicago, Ill.—Marvel automatic high speed saws and hack saws.
- Armstrong Bros. Tool Company, Chicago, Ill.—Grinding machines, tool holders, ratchet drills, lathe dogs, clamps.
- Automatic Ventilator Company, New York, N. Y.—Full size and miniature demonstrating models.
- Besly & Co., Charles H., Chicago, Ill.—New Besly pattern makers disc grinder, helmet spiral circles, temper taps, oil and babbitt.
- Bettendorf Axle Company, Bettendorf, Iowa.—One fifty-ton capacity single center sill underframe and trucks, one forty-ton capacity double center sill underframe and trucks, one Bettendorf truck and truck bolster.
- Buckeye Steel Castings Company, Columbus, Ohio.—Cast steel bolsters and side frames, cast steel journal boxes, pivoted coupler yoke and Major car couplers.
- Bullard Machine Tool Company, Bridgeport, Conn.—Vertical turret lathe, 42 in., maxi-mill type, and 64 in. maxi-mill, both in operation.
- Carborundum Company, Niagara Falls, N. Y.—Carborundum grinding wheels, aloxite grinding wheels, aloxite and carborundum cloth, carborundum brand garnet paper, carborundum and aloxite grains, carborundum fire sand for furnace lining. The grinding wheels were demonstrated on grinding machines under actual shop conditions.
- Carnegie Steel Company, Pittsburgh, Pa.—Schoen steel wheels for engine truck, tender, passenger train car, freight car and street car service; three sets high record service wheels mounted on axles; slick gear blanks, cut and uncut; nickel plated samples of structural shapes and plates; concrete reinforcing bars and other bar mill products; rails, ties and track accessories; soft welding and threading steel for locomotive and car parts, frame bolts, motion pins, nuts, etc., pieces tested and not tested; vanadium steel locomotive springs and locomotive side rods, vanadium steel wheel, vanadium steel street car axle and miscellaneous samples of vanadium steel parts.
- Carter Iron Company, Pittsburgh, Pa.—Carter special staybolt, bar iron, iron chains and ball-bearing chains.
- Chicago Pneumatic Tool Company, Chicago, Ill.—Pneumatic tools, hammers and appliances, compressors and electric drills.
- Chisholm & Moore Mfg. Company, Cleveland, Ohio.—Chain hoists and trolleys.
- Cleveland Twist Drill Company, Cleveland, Ohio.—A drill press in operation giving practical demonstration of Cleveland high speed drills and reamers. Also exhibit typical of complete line of small tools.
- Cochrane-Bly Company, Rochester, N. Y.—One No. 6 8-in. capacity cold saw cutting-off machine, one No. 2 4½-in. capacity cold saw cutting-off machine, one No. 11 automatic saw sharpener, one No. 2 die filing machine.
- Coe Brass Mfg. Company, Ansonia, Conn.—Extruded metals in great variety of intricate designs for car trimming and ornamentation; also for use in electrical apparatus, art metal work, etc.
- Crane Company, Chicago, Ill.—Locomotive safety valves, locomotive blow-off valves, ash pan blower valves, special locomotive cab valves, Crane system of steam traps, non-direct and direct return for returning the condensation to boiler, motor operated steel gate valves for superheated steam, special ferro steel gate valves with clean-out pocket for creosote and zinc-chloride for timber treating plants, Crane railroad unions, malleable and cast iron fittings, brass globe and gate valves for steam, water and hydraulic service.
- Crosby Steam Gate & Valve Company, Boston, Mass.—Muffled safety valves, open safety valves, globe and angle valves, spring seat, Johnstone blow off valves, air pump throttle valves and blower throttle valves, Crosby improved locomotive gages, thermostatic water back gages, standard test gages, hydraulic gages, hydraulic press recorders, wheel press recorders and recording revolution counters. Crosby fluid pressure scales for testing gages to 25,000 lb. Indicators with continuous diagram drums, indicators with lanza continuous diagram appliance.
- Crucible Steel Company of America, Pittsburgh, Pa.—Rex AA high speed tools of various designs, railroad springs, drill rods. Fractures showing heat treatment of steel. Heavy turnings made at high speeds, milling cutters, expanding reamers, dies, chisels, saws, rex AA inserted tooth high speed saw.
- Davis-Bournonville Company, New York, N. Y.—Large oxyacetylene welding and cutting equipment, suitable for railroads and large manufacturing plants, navy yards, etc.
- Detroit Hoist & Machine Company, Detroit, Mich.—Pneumatic turntable tractor, electric turntable tractor, pneumatic motor hoists and pneumatic motors.
- Detroit Lubricator Company, Detroit, Mich.—Feed lubricators. Detroit transfer filler, 1-feed, 2-feed and 4-feed air cylinder lubricators, Detroit air pump lubricator, Detroit emergency valve, automatic steam chest plugs, boiler valves, guide cup, rod cup, Detroit force feed oilers.
- Dixon Crucible Company, Joseph, Jersey City, N. J.—Dixon's pure flake lubricating graphite, graphite greases, silica-graphite paint, pipe joint compound, pencils, crucibles, belt dressings, graphite engine front finish, air brake graphite, etc.
- Duff Mfg. Company, Pittsburgh, Pa.—Barrett track jacks, automatic lowering jacks, geared ratchet screw jacks, Duff bearing screw jacks, Bethlehem forged steel hydraulic jacks.
- Electric Controller & Manufacturing Company, Cleveland, Ohio.—Lifting magnet, operated from electric crane; automatic motor starters, controllers, electric brakes in operation.
- Faessler Mfg. Company, J., Boberly, Mo.—Bass roller flue expanders, universal roller flue expanders, ball bearing roller flue expanders, arch flue expanders, improved sectional beading expanders, pneumatic sectional tube expanders, rapid beading expanders, perfect flue cutting machine and cutters, patch bolt countersinking tools.
- Fairbanks, Morse & Co., Chicago, Ill.—One No. 28 all-steel gasoline motor car for one, two or three passengers, two-cycle two-cylinder direct connecting engine, one No. 26 section gasoline motor car with two-cycle two cylinder gasoline engine. Track jacks, ball bearing jack and hydraulic jacks.
- Flannery Bolt Company, Pittsburgh, Pa.—Tate flexible staybolts, radial and crown staybolts. Tate installation tools for applying the Tate bolt; staybolt tests.
- Foster Company, Walter H., New York, N. Y.—Hydro-pneumatic radial drill, all geared multi-spindle drill, pneumatic stay bolt nipper.
- Franklin Mfg. Company, Franklin, Pa.—Asbestos pipe coverings, asbestos and magnesia pipe and boiler coverings, smoke jacks, corrugated sheathing, shingles, rope and wick packing, throttle and air pump packing, asbestos.
- Goldschmidt Thermit Company, New York, N. Y.—Complete appliances for making thermit welds. Appliances for butt welding wrought iron and steel pipes. Specimen welds showing amalgamation of metal obtained. Metals and alloys produced free from carbon by the thermit process. Photographs of important repairs executed by the thermit process. Samples of thermit, nickel thermit and chromium thermit.
- Harrington, Son & Co., Inc., Edwin, Philadelphia, Pa.—Hand operated portable chain hoists, including Harrington peerless hoists, screw hoists and differential hoists.
- Hunt Company, C. W., New York, N. Y.—Industrial railway, rolled steel and cast plate track, turntables, shop cars, special cars for handling wheels and axles, coal valves, coal tubs, locomotive coaling station models and photographs, hoisting and transmission rope, gravity bucket coal conveyors, motion pictures of cargo handling cranes.
- Independent Pneumatic Tool Company, Chicago, Ill.—Thor piston air drills, reversible flue rolling, reaming, tapping and wood-boring machines, close-quarter drills, grinders, pneumatic chipping, calking, flue beading and riveting hammers, pneumatic staybolt drivers.
- Jenkins Bros., New York, N. Y.—Iron body and brass globe, angle, checks and gate valves, regular and extra heavy; brass and iron body blow-off valves; Jenkins 96 packing pump valves, gasket tubing and car heating discs.
- Jessop & Sons, Inc., New York, N. Y.—Tool steel.
- Johns-Manville Company, H. W., New York, N. Y.—Asbestos roofings, wool felt roofings, waterproofing materials, pipe covering felts, air-pump throttle, coil, spiral and sheet asbestos packings, high and low pressure pipe coverings and pipe covering felts high temperature fire brick cements, pipe covering and boiler cements, electrical materials, boiler laggings and cements, vitribestos pipe coverings.
- Jones & Laughlin Steel Company, Pittsburgh, Pa.—Beams and channels, spikes, tin and black plate, chains, cold rolled bars and shapes, wire and wire products, cold-twisted square bars, angles, bars and special shapes.
- Joyce-Cridland Company, Dayton, Ohio.—Jacks.
- Kennicott Company, Chicago, Ill.—Photographs of all Kennicott products to date.
- Kerite Insulated Wire & Cable Company, New York, N. Y.—Kerite insulated wires and cables.
- Keystone Drop Forge Works, Chester, Pa.—Keystone connecting link, Keystone safety shackle hook and a full line of Standard and Special drop forgings.
- Landis Machine Company, Waynesboro, Pa.—One double head 1½-in. bolt cutter, one single head bolt cutter, pipe threading die heads, solid adjustable die head, automatic open die head for turret lathes, bolt cutters and die heads.
- Landis Tool Company, Waynesboro, Pa.—One 16x72 plain self-contained grinding machine with gap, one No. 2 12x32 universal grinding machine.
- Linde Air Products Company, Buffalo, N. Y.—Oxyacetylene welding and cutting apparatus, single and duplex acetylene generator, stationary type, portable self-contained oxy-acetylene welding and cutting plant, portable oxy-coal gas cutting apparatus for wrecking trains, locomotive boiler repaired by oxy-acetylene welding under hydraulic test pressure, with numerous other samples of locomotive and steel car construction and repair by oxy-acetylene welding.
- Lucas Machine Tool Company, Cleveland, Ohio.—Horizontal boring machine power forcing press.
- Lunkenheimer Company, Cincinnati, Ohio.—Regrinding valves, Renovo regrinding renewable seat valves, puddled semi-steel valves, cast steel valves, iron body brass mounted valves, pop safety valves, water gauges, gauge cocks, oil and grease cups.
- Lupton's Sons Company, David, Philadelphia.—Steel sash.
- Manning, Maxwell & Moore, Inc., New York, N. Y.—Hancock inspirators, Hayden & Derby injectors and ejectors, Metropolitan injectors, Hancock valves, Ashcroft steam gauges, Consolidated pop safety valves, general jet apparatus, machine tools, Celfor drills.
- Matthews-Davis Tool Company, St. Louis, Mo.—Davis expansion boring tools.
- Michigan Lubricator Company, Detroit, Mich.—Locomotive lubricators from two-feed to five-feed automatic drain valves.
- Midvale Steel Company, Philadelphia, Pa.—One rolled steel wheel for passenger service, one rolled steel wheel for freight service, one steel tired wheel for passenger service, one driving axle for locomotive.
- National Tube Company, Pittsburgh, Pa.—Kewanee unions, union ells and tees, flange unions, high duty metal valves and cast and malleable iron fittings, also apparatus used in testing Kewanee unions.



Nelson Valve Company, Philadelphia, Pa.—Gate, globe and check valves, open-hearth steel valves, electrically operated valves.  
 Newhall Engineering Company, George M., Philadelphia, Pa.—Photographs of wrecking, locomotive, station cranes, etc., manufactured by Industrial Works, of Bay City, Michigan. NB air brake hose connection, Vance steam trap.  
 Niles-Bement-Pond Company, New York, N. Y.—New model of the Pond car wheel lathe driven by electricity.  
 Parkesburg Iron Company, Parkesburg, Pa.—Boiler tubes.  
 Reliance Electric & Engineering Company, Cleveland, Ohio.—Reliance adjustable speed motors, of the armature shifting type, with automatic starting equipment; Reliance speed dial, crank shaper, driven by Reliance adjustable speed motor.  
 Rockwell Furnace Company, New York, N. Y.—Furnaces for railroad shops.  
 Royersford Foundry & Machine Company, Royersford, Pa.—Power punch and shear, Sells roller bearing shaft hanger box.  
 Scullin-Gallagher Iron & Steel Company, St. Louis, Mo.—Steel castings.  
 Sellers & Co., Inc., William, Philadelphia, Pa.—Locomotive injectors and accessories, turret rest and face plate drivers, locomotive wheel lathe, turret rest and face plate drivers for car wheel lathe, hangers and couplings for shafting.  
 Strong, Carlisle, Hammond Company, Cleveland, Ohio.—Samples of Randall graphite lubricator and samples bearings, showing the installation of Randall graphite sheet lubricator.  
 Underwood & Co., H. B., Philadelphia, Pa.—Portable cylinder boring bar, rotary boiler tube cleaner, belt driven pipe bender and straightener, new heavy type valve seat rotary planer.  
 Union Mfg. Company, New Britain, Conn.—Complete line of chucks.  
 Union Spring & Mfg. Company, Pittsburgh, Pa.—Coil and elliptic spring, Kensington all-steel journal boxes, pressed steel journal box lids, pressed steel spring plates and steel castings.  
 United Engineering & Foundry Company, Pittsburgh, Pa.—High speed steam-hydraulic forging press in operation on car.  
 Van Dorn & Dutton Company, Cleveland, Ohio.—Portable electrically operated drills and reamers, V. D. & D. gears and pinions.  
 Van Dyck Churchill Company, New York, N. Y.—Higley cutting off saw.  
 Warner & Swasey Company, Cleveland, Ohio.—No. 3A hollow hexagon turret lathe.  
 Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa.—Alternating current and direct current motors, complete with control apparatus, for constant and varying speeds.  
 Westinghouse Lamp Company, Bloomfield, N. J.—Tungsten and carbon lamps for all standard voltages and of all standard sizes.  
 Yale & Towne Mfg. Company, New York, N. Y.—Chain blocks, trolleys, electric hoists and hardware.

## Repair Equipment for Engine Houses

At the convention of the American Railway Master Mechanics' Association at Atlantic City, N. J., a committee on repair equipment for locomotive or engine houses presented a report. It analyzes at length the expediency of doing more repairs than is usually the case in the engine house—the term engine house being offered by the committee as a substitute for the word roundhouse, now no longer descriptive of the modern locomotive shelter. The object of this review of the report is to give a part of the argument and to enumerate briefly what the requirements of the engine house are believed to be in respect to tool equipment.

An investigation showed that \$45 may be taken as the approximate daily net operating income from each locomotive engaged in freight service. This computation assumed each freight locomotive was in service every day. This means that we could afford to invest \$900 capital at 5 per cent. in engine house repair equipment for each extra day in service we could obtain for each freight engine owned, by making the repairs at the engine house instead of at the main shop. Expressed more concretely, it means that, if the engine house repair equipment kept each of 100 freight engines in service two extra days a year, the extra net operating income would be 5 per cent. on a capital of \$180,000. This does not necessarily mean an increased net operating income, as it may, and in the end probably would, mean a smaller capital invested in freight locomotives.

Finally, the committee, C. H. Quereau, chairman; W. H. Fetner, H. P. Meredith, A. G. Trumbull and J. A. Carney, emphasized that it is a short-sighted policy to use worn-out and obsolete tools in engine houses, not only because a big shop is better able to find profitable use for such tools and better able to keep them in repair, but engine-house conditions warrant the best of tools. The chief points arguing for a good equipment of the proper scope are:

Locomotives should be held out of service for repairs as short a time as possible.  
 Should be kept at near 100 per cent. efficiency as possible.  
 The effect on earnings of time saved by repairs made at engine houses.  
 The effect on engine efficiency of repairs made at engine houses.  
 The smaller fixed charges for repairs made at the engine house compared with those at the main shop.  
 The effect of storeroom stocks on engine earnings.  
 Engine-house men should have ideals and methods quite different from those of shop men.  
 It is important that engine-house conditions and facilities should be attractive and convenient to get and keep good men and increase their efficiency.

## Equipment of Outlying Engine Houses

At outlying engine houses it is assumed there are no power-driven machines, and the following list of tools is suggested:

Twist drills.	Pipe cutters.
Drill sockets.	Jack, sledges, drifts, crowbars,
Taps—including machinists'	saws, brace and bits.
steam chest, pipe, wash-out,	Twist drills, extra long.
straight and taper, stay bolt.	Drill chucks.
Dies to correspond.	Ratchets and braces.
Pipe stock and dies.	Surfacer plates.
Hacksaws.	Tinners' bench shears.
Straight edge.	Reamer, rod taper.
Flue tools—caulking rolls, ex-	Wrenches, socket, crowfoot,
panders, beading.	hexagon.

## Equipment at Important Division Terminals

In considering the equipment for engine houses at important division terminals not connected with repair shops, the committee offered the following suggestions: The engine house should be equipped with driving and truck wheel drop pits and tools to take care of all necessary rod work, driving-boxes, ordinary valve-gear work and the replacing of flues needed between general overhauls. The additional list of tools suggested for outlying engine houses to meet the requirements of a larger terminal are:

Ample storeroom stock.	Hot-water washout facilities.
Drop pit for driving-wheels.	Drop pit for engine truck and
Double blacksmith forge, face	tender wheels.
plate and tools.	Portable blacksmith forges.
72-in. boring mill.	36-in. boring mill.
Driving-wheel lathe.	24-in. lathe.
38 in. tire turning-lathe.	16-in. lathe.
Planer.	Shaper.
Slotter.	36-in. vertical drill.
Sensitive drill.	Emery grinder.
Bolt cutter.	Pipe-bending machine.
50-ton hydraulic press.	Punch and shear.
Power-driven valve-setting ma-	Air compressor.
chine.	Air motors.
Air hammers.	

## Machine Tool Work Disturbed by Jarring of Other Machinery

One of the largest machinery building companies of the country has found it necessary to erect a new building for its forging department and locate this at a distance from the main works to avoid the disturbing influence of the hammers on the work of the cutting, boring and drilling tools. For years this department was placed in the midst of the machine shops, having originally been at one end, but finally centered by additions made to the plant. As the forgings gradually increased in size through calls made on the company for heavier machinery, it was observed that the machine tools got out of alignment with increasing frequency, and that excessive vibrations occurred in operating. For some time this was not ascribed to the true cause, and the discovery came as the result of tests which showed that the disturbance was greatest at the hours when the heaviest hammers were in use.

Inquiry at other shops in the same vicinity develops the fact that they are experiencing some trouble from a different cause, namely, the running past their doors of interurban electric cars, some very large and heavy types of which have been put in service within the past year. This was particularly noticeable in the winter, when the ground was frozen. The proprietors of one plant, which was to be replaced by larger works, took that fact into consideration in selecting a new site. Others, similarly located with respect to interurban lines or other disturbing influences, may find it worth while to give consideration to this idea.

The Firth-Sterling Steel Company's stockholders held a meeting at Demmler Station, McKeesport, Pa., June 12, at which the plan to separate the projectile department of the business from the tool steel department was approved. In the future the manufacture of projectiles will be carried on under the name of the Washington Steel & Ordnance Company, the plant being near Washington, D. C., and the tool steel business will continue to be carried on as before by the Firth-Sterling Steel Company, whose works are at Demmler Station and general offices are in the Oliver Building, Pittsburgh. The Firth-Sterling Steel Company, however, will control the Washington Steel & Ordnance Company.

The Canton Foundry & Machine Company, Canton, Ohio, has decreased its capital stock from \$100,000 to \$50,000.

## Scientific Management

F. W. Taylor's Book and Its Lessons

BY A CONNECTICUT MANUFACTURER

Coming before the reading public at a time when so many of our periodicals are each adding its voice to the cry against the existing economic condition, "The Principles of Scientific Management" is accomplishing more than perhaps its author dared hope for. And it is doubtful if any book of its kind has brought about such heated discussion in the technical press as has this. It is rather unfortunate, however, that in the presentation of arguments in support of the principles involved the author should have allowed the impression to be given that workmen of inferior mental caliber are preferable in carrying out his ideas, and that he should further have chosen examples which by many are not considered convincing as to the general applicability of the system. We say this because we dislike to see a good thing maimed at the start; the country needs as many trusty blades to defend and advance it just as present as it can muster, and it is regrettable to have such a valuable recruit as this book seem to anyone to wear the uniform of the enemy.

That the principles set forth are not new the author very generously admits; in fact, his whole attitude throughout the book is in that respect commendable. The point is that for a number of reasons, and from certain well-defined causes, a grievous waste of human effort exists and is allowed to exist, which waste is in a measure allowed to exist by those very people who would benefit the most by its correction. It is in the repeated and emphatic admission of this last that the book is unique. One expects such statements from members of the class who are admittedly suffering from the unreasonable conditions that exist among the people on this planet, but we think that never before have there been so many men among the well-to-do who understand and voluntarily admit the injustice of things as they are. There have been Cassandras, but always have they been treated as such.

When, however, we find a vice-president of a large Western concern telling his fellows "that every man who is willing to work is entitled to a living, and that no man is entitled to so much that somebody else must go hungry," when a man of Judge Gary's stamp talks of co-operation and universal welfare as he did recently—hearing such things it is impossible to doubt that a way is being shown, that the light is becoming clearer, that the solution of it all is evolution and not revolution.

### The Obstacles to Changing Existing Conditions

Mr. Taylor states that serious obstacles exist to sudden change from existing conditions to those he advocates; he urges that the principles he puts forward be cautiously applied if good results are to be expected. To any manufacturer reading the book specific obstacles to the application of the principles to his own business will at once present themselves. Obstacles, however, exist but to be overcome, and the hardest obstacle of them all is usually to bring oneself to agree that the other fellow's way is the best. Especially is this so in the present case, where the proposed change hits the very foundation stones on which the business of to-day is built. Business is said to be strife, and, now, when the suggestion comes, as Mr. Taylor gives it, to remove for good and all the bitterness that exists so widely between employer and employee, there is something of the nature of a shock to the sensibilities of the average factory owner when for the first time the meaning of it all comes clearly home to him; it seems like giving up a fair advantage.

That the acceptance of the principles will gain adherents rapidly seems quite probable, for, far from calling upon the employers for any sacrifice, the thing is shown to work distinctly as a mutual advantage. A proposition based on natural laws of human nature, such as Taylorism can be shown to be, cannot but succeed; it is only when natural laws are broken that evil results.

Up to the present time the tendency in manufacturing has been strongly toward the reduction of costs more through the introduction of automatic machinery than by speeding up the operators. Contrary to the supposition

held by many and advanced by all labor agitators, this tendency has not resulted in increased idleness among the workers but in greater output by the same working force with a corresponding reduction in cost and an increased consumption. Commendable as has been this progress in the application of automatic features to the machinery of manufacture, the time has come when, as a nation occupying a position in the front rank, we cannot ignore our duty in respect to the proper utilization of our skilled and unskilled labor. Long habit, or moral blindness, has made seem right and "good business" what we shall soon see partakes of the less admirable qualities of our natures, and, because habit is by nature slow to uproot, so will the change for the better not be swift. Yet the extreme instability of our social structure as it exists to-day must soon become evident to all of those to whom it has been given to hold the balance of power, and it is to be hoped that no such conflict will precede the readjustment as history shows to have been necessary in past ages.

## Edison Giant Roll Patents Sustained

A decision has been handed down by Judge Hazel in the United States Circuit Court of the western district of New York in a suit against the Allis-Chalmers Company and two of its customers, the Empire Limestone Company and the Casparis Company, on Edison patents Nos. 672,616 and 672,617, granted April 23, 1901, on the so-called giant rolls. These rolls are referred to in the recent book "Edison; His Life and Inventions," by Frank L. Dyer and T. Commerford Martin:

No such departure was as radical as that of the method of crushing the ore. . . . With his usual tendency to upset traditional observances, Edison conceived the bold idea of constructing gigantic rolls which, by the force of momentum, would be capable of crushing individual rocks of vastly greater size than ever before attempted. . . . Engineers to whom Edison communicated his ideas were unanimous in declaring the thing an impossibility; that it was like driving two express trains into each other at full speed to crack a great rock placed between them; that no practical machinery could be built to stand the terrific impact and strains. Edison's convictions were strong, however, and he persisted.

Judge Hazel, in referring to the patents under consideration and in setting forth a judicial review of Edison's accomplishment, said:

The patentee surmounted all obstacles and the record shows there were many. He was the first to evolve a crusher by which kinetic energy became a potential factor in the method of crushing and breaking rock by blows from the knobs on rollers. It scarcely can be doubted that his inventions are meritorious and involve in their organization and perfection patentable skill of a high order.

The court then refers to the claims of the two patents, one covering broadly the method involved in crushing rock by kinetic energy and the other relating to the apparatus employing the two massive rolls which are so driven as to permit the crushing and breaking to take place. It was urged in defense of the suit that crushing rolls of much smaller size had been used, generally geared together, and that no invention would be required to increase the size and weight of such rolls and to dispense with the gear so as to permit the rolls to operate independently. Concerning this defense, Judge Hazel said:

In the prior art there is not disclosed any method or apparatus for breaking rock by the medium of crushing rolls which are provided with knobs or projections and are driven by belting. They were provided in most instances with teeth or projections on the rolls which were geared together and their function was to compress, pinch or pick the material to separate the particles. The driving agent apparently performed the work of crushing the material while in the patents under consideration there is a distinct departure, the material being wholly crushed or broken by the energy of the knobs on the rolls. Although some of the separate elements of the claims in controversy were old and are found in the prior apparatuses, yet such old elements had never before been assembled or combined to use power stored in the rolls to break or crush rock nor prior to the inventions in suit had such rock been broken or crushed by hammer blows from projections on the rolls driven by belt and rotating in opposite directions.

The defendants' structure was practically a copy of the Edison rolls, and the court therefore had no difficulty in promptly deciding them to be an infringement.

R. W. Oswald, Jenkins Arcade Building, Pittsburgh, representing the Pennsylvania Boiler Works, Erie, Pa., reports the following sales of boilers for 125 lb. working pressure: Pitt Coal Company, Pittsburgh, 150 hp.; Bethany College, Wellsburg, W. Va., 250 hp.; W. J. Rainey Company, Uniontown, Pa., 125 hp.



## A New Punching Machine Control

BY G. A. BISSET, NAVAL CONSTRUCTOR, U. S. N., MUNHALL, PA.

A highly efficient type of punching machine has been discovered at last, and, strange as it may seem, the necessary principles were found to exist in a machine designed and operated very successfully for an entirely different purpose. In fact, it is a safe assumption that the designers of the Davy steam-hydraulic forging press, which was illustrated in *The Iron Age* April 15, 1909, and June 30, 1910, never contemplated the eventual application of the idea to punching machines.

The features of a perfect punching machine long impossible even to approximate in actual machines are:

(a) A control that will leave the feet and hands of the operator free for other purposes.

(b) A control that can be operated with ease.

(c) Immediate response on the part of the machine the instant the "control" is operated, that is, the punch should descend as soon as the control lever is operated, and not wait during a fraction of a revolution until a cam bears.

(d) The punch should rise immediately after punching a hole, but rise only just high enough to clear the plate, this height being readily adjustable for different thicknesses of plates. This feature is of great value as it enables the next hole to be centered with great accuracy, the plate being moved until the punch covers the white circle which indicates where the hole should be.

All the above results can be accomplished in a most efficient manner by a very slight electrical addition to the Davy press redesigned as a punching machine.

The punching is done by the hydraulic cylinder against air pressure in two other cylinders abreast of the hydraulic cylinder, or one above it, as shown in Fig. 1, while a press of the type to which it can be applied is illustrated

which may be the operator's mouth, or between his knees if he is sitting down. When the punch reaches the bottom of its stroke the current in the circuit of which the solenoid *q* forms a part is reserved and the lever *l* is brought back against the stop *s*.

The ease with which this machine can be operated and its immediate response enable time to be saved in punching every hole, the amount saved being equal to that elapsing between the centering of the punch over the next hole and the bearing of the cam of the ordinary punching machine. This time is invariably and unavoidably wasted with the cam machines. While some of it

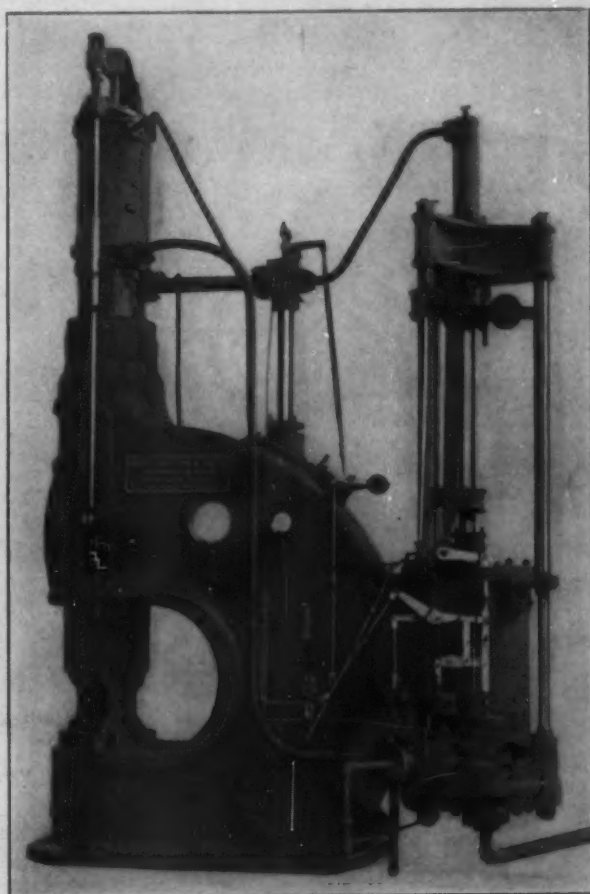


Fig. 2.—The Control Applied to a Davy Steam-Hydraulic Forging Press, Built by the United Engineering & Foundry Company, Pittsburgh, Pa.

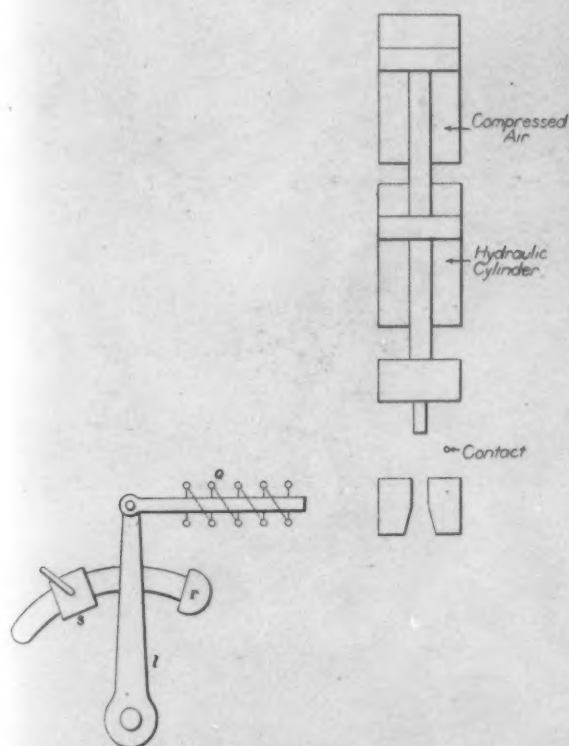


Fig. 1.—Details of a New Attachment to Secure Accurate Control of Punching.

in Fig. 2. The air cylinders are connected to the compressed air system of the plant in which the punch is installed. As the plunger moves down in punching a hole through a plate it completes an electrical circuit as the down stroke is finished. This circuit releases the pressure in the hydraulic cylinder and allows the air cylinders to withdraw the punch slide to a predetermined distance, depending upon the location of the stop *s* for the control lever. This stop can be adjusted for any thickness of plate within the capacity of the machine. The punch is started downward by moving the lever *l* against the stop *r*, this movement being controlled by the electrical circuit through the solenoid *q*. The contacts which complete this circuit are kept at the most convenient place,

might be saved in their use by increasing the speed it would be at a loss in capacity or power and at an increase in danger from the flywheel in case of overload.

The high first cost of a steam-hydraulic punching machine would be offset by its value for various purposes, flanging, manhole cutting, shearing, bending and forging.

The Foreign Steel Company, 90 West street, New York, has taken the agency for the line of tool steels made by J. J. Saville & Co., Ltd., Sheffield, England, and will handle their products in North and South America and in Canada through a Canadian company. J. J. Saville & Co., Ltd., have been in existence since 1774 and are well known in Europe as makers of the Triumph high-speed steel and drills; in addition to the Sheffield works, they have a steel plant in Lieau, Russia. The directors of the Foreign Steel Company are John J. Boyd, F. S. Tainter, E. R. Reets and William Wormser.

The Cleveland Machine Tool Works, Cleveland, Ohio, is now under the sole ownership of J. G. Bellinger, who has purchased the interest of his partner, Fred W. Bowler.

The Cleveland Auto Spring Company, Cleveland, has changed its name to the B. E. F. Auto Springs Company.

The Oliver Foundry & Machine Company, Ironton, Ohio, has changed its name to the Ironton Punch & Sear Company.

## A Museum of the Wire Industry

The American Steel & Wire Company's Permanent Exposition, the Probable Nucleus of an Institution of Much Wider Scope.

The American Steel & Wire Company has departed from the ordinary commercial workings of a corporation by establishing an Industrial Museum, the primary object of which is to preserve the fast disappearing records and relics illustrating the beginnings of the wire industry in this country. The museum was founded in 1908 by the president of the company, William P. Palmer, himself an enthusiastic collector, who realized that in the rush and turmoil of present-day business the early history of an industry is apt to be forgotten unless organized steps are taken to rescue and preserve the surviving evidences of its childhood.

While thus far the collection of exhibits consists mainly of specimens of early products and equipment, it also includes many documents of historic importance, a collection of portraits of men who have been and those who still are prominent in steel and wire, and also many miscel-

been covered by his predecessors. In this way, the museum should prove the source of some degree of economy and commercial profit.

The establishment of the museum has the hearty endorsement of C. L. Miller, vice-president and general superintendent, and as a result of his active interest in the enterprise, the operating departments throughout the American Steel & Wire Company's plant are lending valuable assistance in securing articles of historic interest and other suitable material to add to the museum collection.

All of the company's districts are represented on the museum committee, of which Chief Engineer F. H. Daniels is chairman. The museum thus belongs equally to all districts, and contributions have come to it from all directions. The other members of the committee in charge of the museum enterprise are as follows: F. C. Gedge, Chicago; B. B. Ayers, Chicago; R. W. Ney, Cleveland; E.



Fig. 1.—The American Steel & Wire Company's Museum—A View of the Barbed Fence Exhibit.

laneous pictures pertaining to the manufacture of steel and wire. The ultimate scope and purpose of the museum are, however, far broader than this. It is contemplated to have within the walls of the institution a progressive exhibit which shall be educational in its character and which shall represent in successive stages the progress of the raw material from the mine to the market in the almost infinite variety of commercial products. Each epoch of the industry will be shown in its entirety, so far as it is possible to bring about the result.

### The Museum Building

A detached building at the North Works, Worcester, Mass., has been set apart and fitted up for the museum. It is provided with a fireproof vault and is equipped with automatic sprinklers, rendering its contents practically safe against fire. The finish of the rooms is simple and attractive, forming an excellent setting for the exhibits. The collection is already one of large variety. Looking at the institution apart from its historic interest, as it becomes complete in present-day collections as well as in what is recoverable from the past, it must afford inspiration to the inventor and designer, not only as to what to create, but also as to what to avoid. It is no infrequent experience for an engineer to discover that he has wasted much valuable time in going over ground that has already

Boley, Cleveland; J. W. Carpenter, Pittsburgh; H. W. Willson, Worcester, and A. G. Warren, Worcester, secretary.

### Some Details of the Exhibits

Figs. 1 and 2 show opposite views of the southeast room containing the barbed-wire fence exhibit. This collection is quite extensive, including specimens of early barbed wire in many and varied forms, beginning with the "wire provided with a series of spur wheels" patented by William D. Hunt in July, 1867, as seen in Fig. 5. In Fig. 6, to quote the inscription, is "the first piece of double strand barbed wire fencing ever made with the intention of holding the barbs in place by twisting two strands together. Made in 1874 by Joseph F. Glidden at the old Glidden homestead, DeKalb, Ill. Twisted on the small crank of a grindstone, which Mrs. Glidden turned for the purpose. The wire tightened on the crank and could be removed only by cutting with a cold chisel. The specimen shows where it was cut away from the crank."

In this room is the collection of models of barbed-wire machines which possess a historic importance from the fact that they served as court exhibits during the barbed-wire patent litigation which was raging fast and furious in the courts of the Middle West 25 to 30 years ago.

The northeast room, shown in Fig. 3, contains, besides



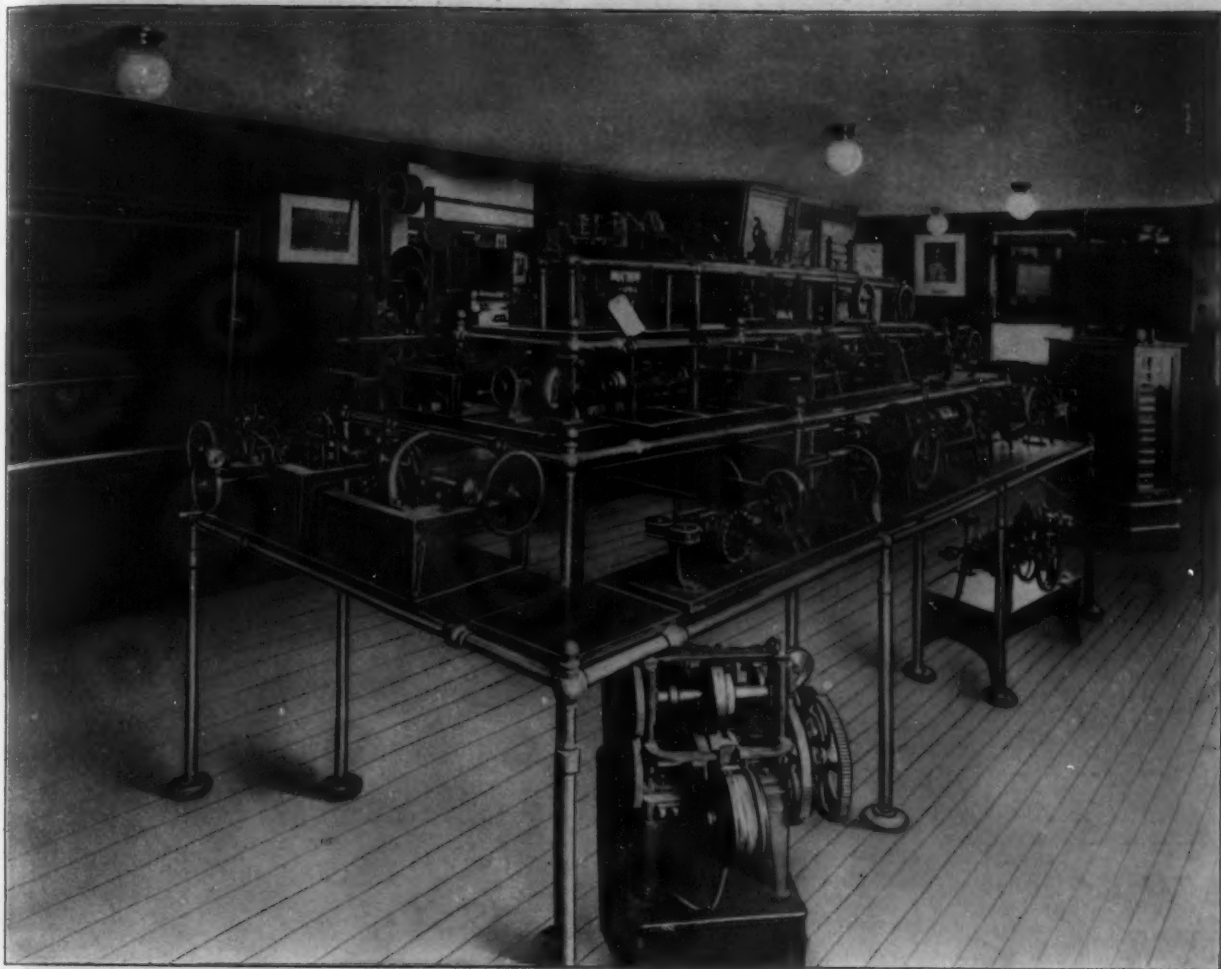


Fig. 2.—The Barbed Wire Fence Room—The Collection of Models of Machinery.



Fig. 3.—The Northeast Room and Its Models of Rolling Mills and the Gallery of Portraits.



Fig. 4.—The Southwest Room—Two Historic Wire Nail Machines.

a gallery of portraits and various interesting souvenirs, a bale-tie exhibit and several models of rolling mills and rolling mill appliances. Here, also, may be seen views of the various plants which were merged into the one corporation, the American Steel & Wire Company, in 1899; several views of the first cable street railroad in the world,

installed in San Francisco in 1873; and many specimens of street railroad cable, both unused and worn out in service. Specimens of steel track strand, and photographs illustrating its use across the canyons of the far West, are found in this room.

#### Historic Wire Nail Machines

In the southeast room (Fig. 4) are two wire nail machines from Covington, Ky., where the Kentucky Wire Nail Works was organized in 1873. The necessary funds were furnished by Rev. Joseph Goebbels, a Roman Catholic priest who had a parish in Covington, but the practical success of the enterprise was due almost wholly to the skill, energy and perseverance of the late Michael

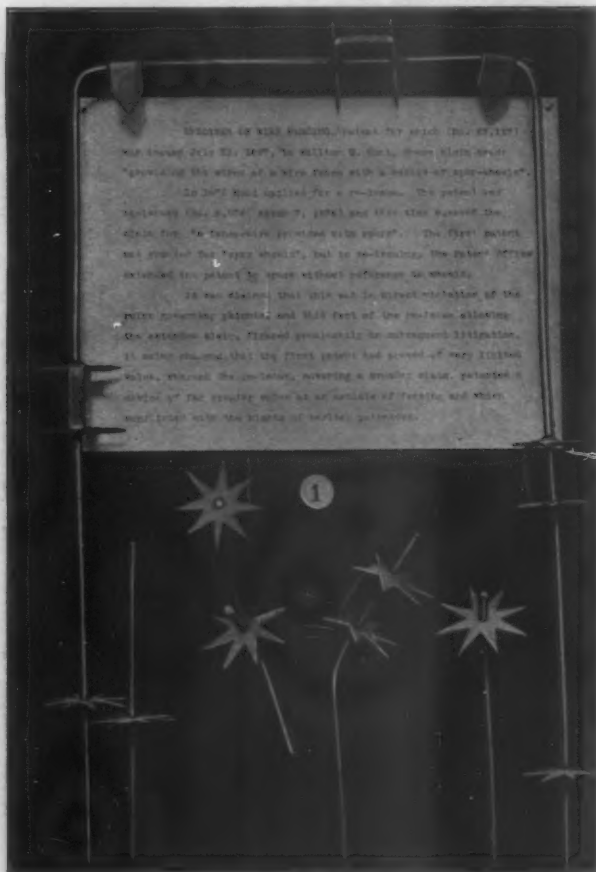


Fig. 5.—A Typical Barbed Wire Fence Exhibit. Wire Provided with a Series of Spur Wheels.

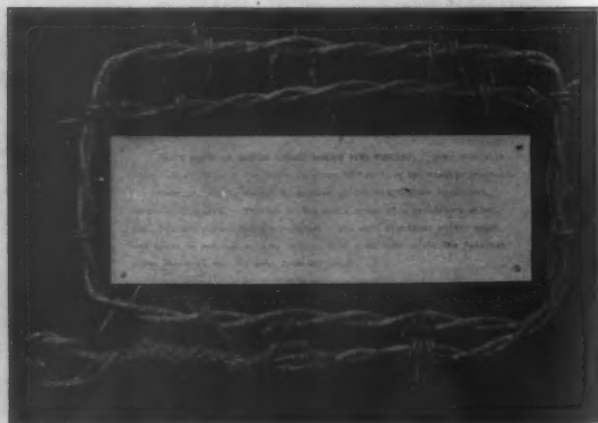


Fig. 6.—The First Piece of Double Strand Barbed Wire Fence. Twisted on a Grindstone Crank by J. F. Glidden.

Baackes, brother of Frank Baackes, vice-president and general sales agent of the American Steel & Wire Company.

One of these machines was built in Germany, the other was built in Covington, after a German pattern. Both machines have seen upward of 30 years of service. Another machine, not shown in the photograph, is of still greater interest, being the first wire nail machine built in America. This is an English type and was constructed



in New York in 1851 for Morton & Bremner; and was owned and operated later by William Hassall and his son, John Hassall, who donated it to the museum.

On the second floor, among other exhibits, is the model of a blast furnace built at Newburgh, Cleveland, in 1865, and recently dismantled, representing a type efficient in its day, but now superseded by one more economical in its operation and output. Here, also, are the rotted timbers and worn-out gears of an ancient rod frame, and several small annealing pots, all of which formed part of the early equipment of Ichabod Washburn's wire factory in Worcester. Another article from the same old factory is a Roman steelyard made in the year 1774, as attested by the date stamped on the beam.

#### Secrecy No Longer an Industrial Factor

The secret processes and methods employed in wire manufacture in Nurnburg and other parts of Europe were jealously guarded for centuries and handed down from father to son for many generations. This policy of secrecy, which was generally maintained in this country also with regard to making wire until recent years, is now practically abandoned. Rolling mills and wire drawing machinery are to-day purchased in the open market, all manufacturers having equal opportunity to choose the best.

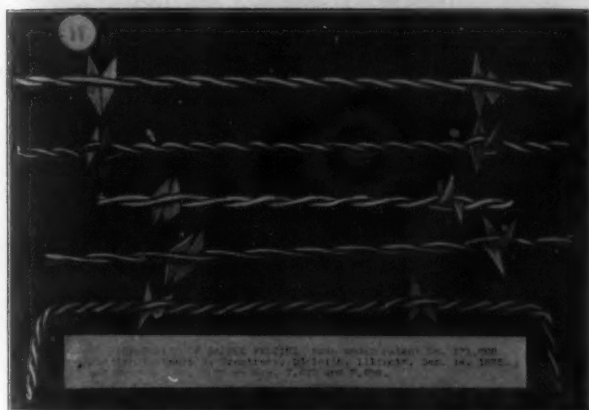


Fig. 7.—Some Interesting Specimens of Barbed Wire Fence.

This they do realizing that it is not the best equipment, but the man behind the equipment, that spells success or failure for their business.

As with the present-day manufacture of wire, so with the museum idea. There is no thought of restricting the privileges and benefits of the museum to a favored few who may chance to be associated together. The American Steel & Wire Company asks no financial assistance in this new industry. But it welcomes co-operation from outside in the form of contributions of material, which must come from all quarters if the museum is to prove a success; and the use of this museum is freely offered to any who are sufficiently interested to pay it a visit.

It is hoped that as the years pass the Industrial Museum will continue to grow and develop a usefulness of which its present contents is merely a suggestion.

#### Tradition and the Future

Tradition is by no means an unimportant factor in industrial organization, particularly when it is coupled with the friendly relations of employer and employees. In the case of the American Steel & Wire Company this is particularly true, for, as the world knows, the management has carried its interest in its workmen to a point where a very lively appreciation exists on the part of the employees. Therefore, the esprit de corps is strong. The museum contains many inspiring reminders of the earlier days of the industry. An old bell that called men to work when the industry was young, sounding from the cupola of Ichabod Washburn's mill; the flag pole which was raised at the Central Works, Worcester, that the flag might be unfurled when the news of Lee's surrender was received; portraits of friendly employers and heads of departments, and of groups of workmen—these and other similar exhibits have much to do with emphasizing the amicable relations in the works.

As has been stated, the museum is really in its experimental stage. It is not a wide prophecy to assert that it

may be the beginning of a great institution in which the entire United States Steel Corporation will be represented in a lavish and complete exhibit of the products and methods and history of the great company. It would be one of the most complete, if not the most complete, industrial collections in the world; for it would take the great basic industry of iron and steel and all of its branches from the mines to the finished products, not only as the industry exists to-day, but as it has existed during its various periods from the very beginning.

#### Oscillating Sand Sifter

A new sand sifter is being brought out by the Gregg Mfg. Company, Cleveland, Ohio. An important feature of this sifter is that an oscillating motion is imparted, it being claimed that it is the only oscillating riddle on the market. The appliance is operated by a compressed air motor, which is simple in construction and has but few parts.

In designing the piston and the valve the principle of the steam engine was applied. The piston rod connects directly with the sieve holder or clamp and the sieve oscillates on a center post as shown. The piston rod has a 5-in. stroke, which gives that amount of motion to the



A New Oscillating Sand Sifter, Made by the Gregg Mfg. Company, Cleveland, Ohio.

sieve. The motor is completely inclosed so that sand is excluded from the working parts. The front of the motor case is provided with a box packed with waste which keeps the piston rod clean. The sieve holder is so constructed that the center is supported by cross bars. A spring band is provided for clamping the sieve, so that as soon as the band is released the sieve is perfectly free. There is a pipe and hose connection for air on the under side of the motor.

The machine is easily put in operation by simply opening the air valve. The riddle can be easily and quickly moved about the foundry in wheelbarrow style, a wheel on the rear leg and handles on the front legs being provided for that purpose. It is substantially built for hard continuous service.

It is claimed for this machine that it shifts sand more rapidly than other power riddles. The sand rests on the wire mesh and is cut by the oscillating motion, thus increasing its rapidity. It is a slow motion riddle and has practically no vibration. By not shifting sand from one side to the other vibration is eliminated and the machine escapes danger of going to pieces from continual racking.

The United Steel Company, Canton, Ohio, has installed a heat treating plant for its vanadium steel products. While large buyers usually have heat treating plants of their own, the small consumers do not, and the new department is to accommodate the latter class of trade. The company reports an active demand for vanadium steel. It recently received an order from an automobile manufacturer in Russia, this being the first order to come from that country.

## Gary 60-Inch Universal Plate Mill

New Precedents in Speed, Size and Weight at the Gary, Ind., Plant—Monthly Capacity 20,000 Tons

During the trial run of the recently completed 60-in. universal plate mill of the Indiana Steel Company at Gary, Ind., a plate 141 ft. long, 34 in. wide and  $\frac{3}{8}$  in. thick was rolled without reheating from a 12-in. ingot. From these figures a quick appreciation of the speed and capacity of the mill is possible. The estimated output will be 20,000 tons monthly. The limiting factors governing the width, length and thickness of plate that can be rolled are readily defined. As to width, the mill's maximum rating for universal plates—60 in.—may be increased to 84 in. for sheared plate by removing the vertical rolls, for which provision is made, and thus converting the mill into a plain three-high type. The minimum thickness to which a plate can be rolled is in this instance a function of the length of the cooling beds and of the size of the ingot used. The cooling beds are 150 ft. long and the smallest ingot is 12 in. Within this length and from this size ingot the minimum thickness to which a plate can be worked down conveniently is about  $\frac{5}{16}$  in. The capacity

The mill was built by the Morgan Engineering Company, Alliance, Ohio. It will have a horizontal roll speed of 760 ft. per minute and it is expected that a 12-in. ingot can be broken down and rolled out into a  $\frac{1}{2}$ -in. plate in 22 passes in an elapsed time of about 2 min. The vertical rolls will feed at a speed about 8 per cent. slower than the horizontal rolls are running. The adjustment of the rolls is entirely controlled by independent motors. The bottom roll is fixed and the screw-downs for raising and lowering the counter-balanced top roll are each operated by a 50-hp. Crocker-Wheeler motor. The screw-downs are graduated to show the movement of the rolls to 0.01 in. The middle or floating roll is raised and lowered by a 100-hp. motor and rolls with the plate as it is going through.

The tilting tables are operated simultaneously from a 150-hp. motor driving through a lever arm, crank and shaft. The tables are carried on trunnions at the outer ends and swing on these centers. The tables are about 32



Fig. 1.—60-in. Universal Plate Mill, Indiana Steel Company, Showing Drive Housings; Driving Motor Is Farther to the Right.

of the mill would be held within smaller limits by the length of the table from the mill to the straightening rolls if it were not that facilities are provided for moving these rolls out of the way. The rolls are mounted on long shoes at right angles to the lines of the mill. Actuated by a motor-driven screw, the entire set of rolls can be moved aside, table rolls substituted and unusually long plates rolled directly onto the cooling beds.

The other important universal plate mill of the Chicago district is the one at South Works of the Illinois Steel Company and described in *The Iron Age* of January 16, 1908. That is a two-high reversing type, operated under the Ward Leonard-Ilgner system of control. The Gary mill is a three-high continuous type and in addition is the largest plate mill ever built. Fig. 1 is a view of the mill. It is driven by a motor which, with its continuous rated capacity of 6500 hp. and tremendous overload possibilities, has power to drive any other part of the mill to the breaking limit.

ft. long and are made up of eighteen 16-in. rolls, 5 ft. 11 in. long. The rolls drive from both ends and are operated by special reversing-type 100-hp. motors, one for each table. All of these motors are located in a pit at the side of the mill, a view of which is shown in Fig. 3. The drive from the main motor is split in the two gear housings shown in Fig. 1, so that the horizontal and vertical rolls of the mill are driven from separate shafts. The horizontal rolls are 84 in. long, 36 in. diameter, with necks 25 in. in diameter. The vertical rolls are 21 x 23 in. This mill establishes new precedents in speed, size and weight.

The main rolls are driven by a 6500-hp., 6600-volt, 3-phase, 25-cycle, slip-ring type induction motor so wound and connected to its control apparatus as to give two definite rolling speeds, 53½ r.p.m. and 107 r.p.m. In addition to being the largest motor ever built in this country, it is the first application of a two-speed alternating-current motor to a mill of this sort. The complete unit weighs approximately 450 tons and has an overall diameter of



21 ft. The revolving element weighs about 125 tons. The motor was too large to be shipped assembled, so that the assembling of the windings and punchings was done entirely at the point of installation.

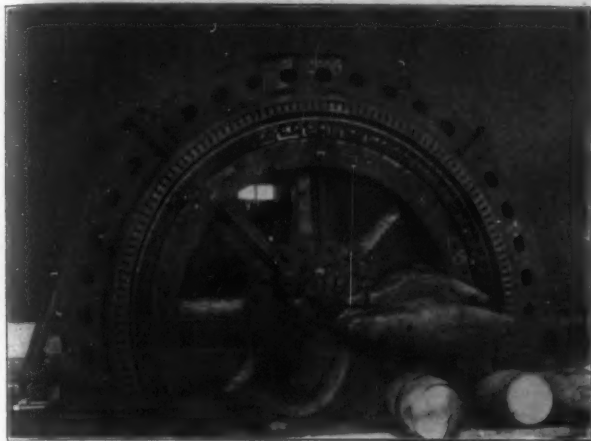


Fig. 2.—6500-hp. General Electric Induction Motor for Driving the Mill.

is not used, as indicated in Fig. 2, which is a view of this motor, the effect being contained in the rotor itself. A suitable resistance is permanently connected into the rotor circuit which provides for a predetermined slip in speed during each pass, so that the flywheel energy may properly perform its function.

The motor is controlled, stopped and started by the operator through a master controller located on the operating pulpit in the mill proper. The motor itself contains but one stator winding, and since the speed combination is exactly two to one, this winding is reduced to the simplest form. The motor characteristics as regards efficiency and power factor are found correspondingly excellent. A notable feature of the operation of the pole-changing switch lies in a combination of connections and resistance whereby surging of the system is prevented, as the supply circuit is never opened when changing from one speed to the other during the rolling period.

The small motors throughout the mill are direct-current Crocker-Wheeler mill type, the current supply being obtained from two 500-kw. motor generator sets located in the same room with the main drive and operating at 375 r.p.m. These sets are each made up of a 500-kw. 250-volt compound-wound direct-current generator, direct connected to and on the same base with a 530-k.v.a.

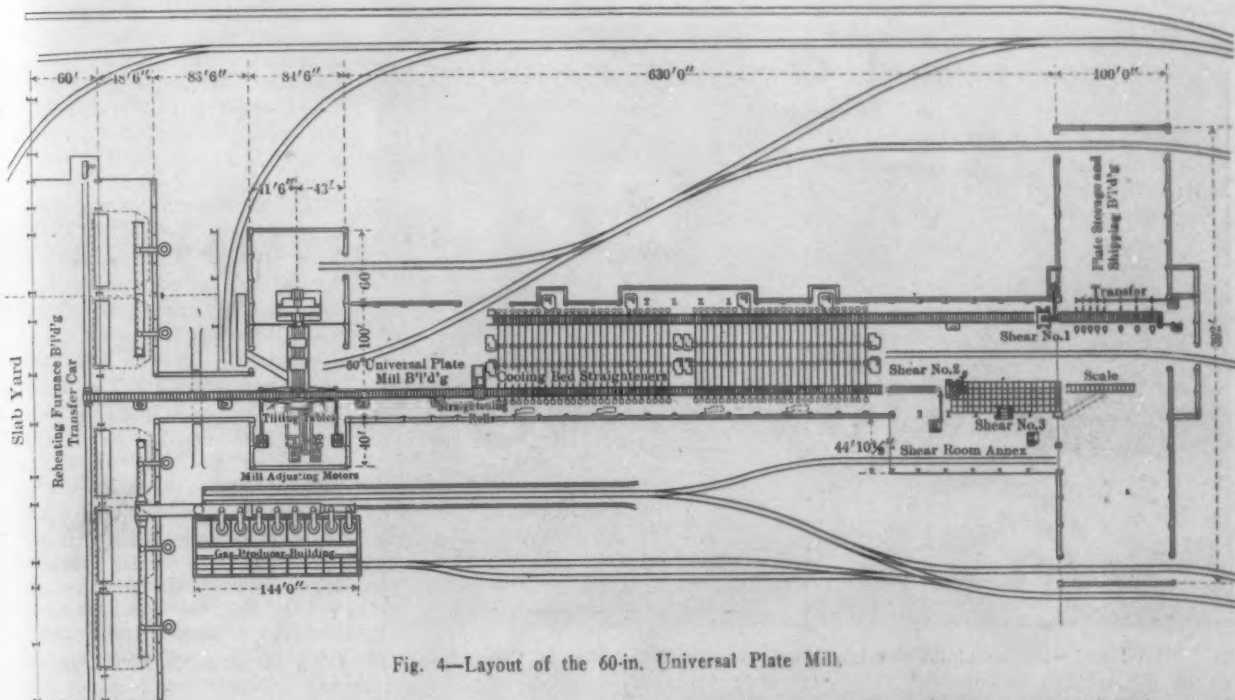


Fig. 4.—Layout of the 60-in. Universal Plate Mill.

In addition to the regular automatic starting and control equipment furnished with a motor of this character, a large motor-operated air-brake pole-changing switch is provided for changing from low to high speeds and vice versa. A definite interval of several seconds transpires during the change from one speed to the other. In regular operation the pole-changing switch is set for a speed of 53½ r.p.m., the windings being connected for a combination of 56 poles; the main line switch is closed and the motor is brought to speed. A certain number of the first breaking down passes are made at the low speed, at which time the operator changes the position of the pole-changing switch, giving a winding combination of 28 poles and 107 r.p.m. for the final passes. The pole-changing switch is of a new design especially constructed so that it can be operated continuously at short intervals as required by the rolling operation.

The motor and its control equipment are located in a separate room protected from the mill room by a steel partition. A 50-ton crane traverses both mill room and the motor room and, to permit passage of the crane from one room to the other, the upper portion of the steel partition above the crane runway is movable with the crane.

The design of the motor provides for a liberal flywheel effect in the revolving element for the purpose of absorbing the shocks and preventing intermittent peaks of short duration on the generating station. An external flywheel



Fig. 3.—Two of the 50-hp. Motors for Adjusting the Mill Rolls; the 100-hp. Motor for Operating Tilting Table in Same Pit.

6600-volt 3-phase 25-cycle synchronous motor, which receives its supply from the same generating station as does the large motor. These sets as well as the main drive were built by the General Electric Company.

The plate mill is immediately adjoining the billet mill and soaking pits. At present there is no slabbing mill at the Gary plant. Plans have been projected for a 36-in. slabbing mill and a 160-in. sheared plate mill, so that the rolling of plates direct from ingots, as at present, is not intended to be the permanent practice. Referring to Fig. 4, the center line of the mill lies in an east and west direction, the movement of the material being from east to west.

At the east end the ingot and slab receiving and storage yard is laid at right angles to the mill and is spanned by a 15-ton yard ingot crane. This crane is designed especially for the purpose and the upper portion of the trolley is arranged to revolve while a gripping mechanism is provided for the handling of cold ingots. The yard under the crane is 82 ft. wide and 472 ft. long.



Fig. 6.—Rear of Reheating Furnaces, Showing Overhead Galleries for Carrying Electrical Door Operating Motors and Drive.



Fig. 5.—Portion of the Reheating Furnaces with 15-Ton Charging Crane.

furnace building fronts on this yard, the furnace charging floor being immediately adjacent, so that the charging cranes can reach from the charging floor into the storage yard and pick up ingots to be placed in the furnace. Two of these 15-ton slab drawing and charging machines operate along the furnace frontage over a 56-ft. span. They are of the vertical lift, end grip type, with sufficient lift to permit picking up ingots from the floor. One of these cranes is shown in Fig. 5.

The five reheating furnaces are more than ordinarily large. They carry six doors, are 62 x 14 ft. overall and have a hearth measurement of 45 x 9 ft. They are standard Siemens regenerative furnaces with Siemens valves. Both doors and valves are electrically operated, the overhead platforms shown in Fig. 6 carrying the 5-hp. operating motors. The valves are coupled for alternate operation with the well-known overhead chain method. From the furnaces to the approach table the hot ingots are handled on a transfer car. The table of this car consists of rolls which, when the car is lined up with the mill table, constitute an extension of that table. When in the proper position, the transfer table rolls

automatically cut into the approach table drive and operate with it, thus delivering the piece to the table.

Although the speed of the approach table is about 750 ft. a minute an unusual equipment has been installed for the more rapid delivery of the ingot to the mill. In Fig. 7 is shown a special 15-ton ingot transfer crane, spanning the approach table and with a runway extending as far as the tilting tables. This crane is equipped with a special cradle comprising four arms, as illustrated, so shaped and spaced as to permit them to come down between the table rolls and pick up the ingot, thence carrying it to a point where it may be laid on the tilting table direct. The lifting motion of this crane is effected by means of a connecting rod and crank, the total lift being 30 in. The length of the approach table is approximately 140 ft. and the time this equipment was installed to save is the few seconds of interval between the end of the last pass of the

rolled plate and the beginning of the first pass of the new ingot. This crane as well as those mentioned was built by the Alliance Machine Company, Alliance, Ohio.

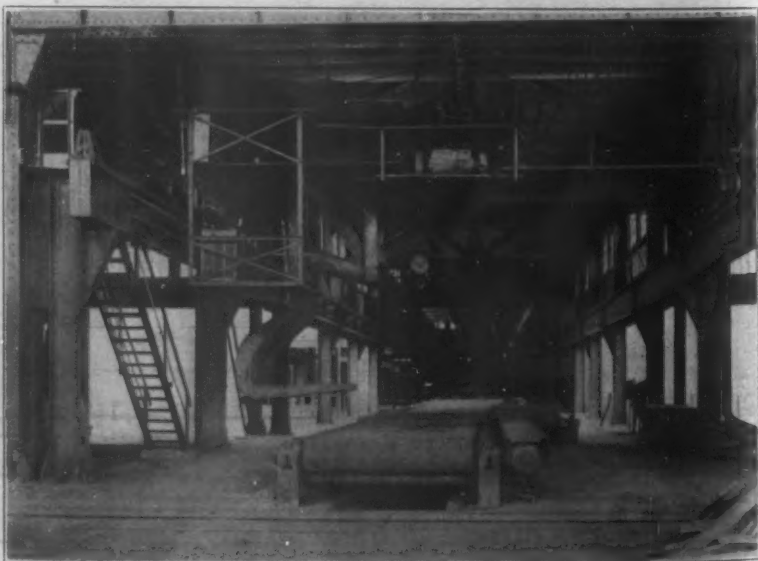


Fig. 7.—Approach Table to Mill and Ingot Transfer Crane.



From the mill the plate is delivered to the straightening rolls, which were built by the R. S. Newbold & Sons Company, Norristown, Pa., and thence to the cooling beds. Two cooling beds, each 150 ft. long, are arranged in tandem with the two 50-hp. motors for operating at each end of each bed. The design of the cooling beds, which were furnished by the Wheeling Mold & Foundry Company, Wheeling, W. Va., is illustrated in the cross-section, Fig. 8. A general view of these beds is presented in Fig. 9, looking in the direction of the shears. From the roll table the plate is pulled over to the side straighteners by the chain drag. The pulpits from which the side straighteners are operated are located between the two cooling beds and lined up with the straighteners so that the operator can bring the jaws up to just the right point and avoid buckling the plate. The plate is lifted off the straightener by a portion of the bed frame, which acts as a tilting arm, as indicated in the cross-section shown. The drags carry the plate across and pull it up on skids, which hold the plate, permitting the chain to free itself. From these skids the plate is lifted on to the table for delivery to No. 1 cutting shear.

This shear, Fig. 9, is a heavy guillotine type, motor driven and built by the Morgan Engineering Company. It is equipped with pneumatic counter-balance for the shearing jaw and also with a tilting delivery table. This table swings from one end and its function is to permit the piling up of several sections of the plate as they are cut off by the shear. The table will dip sufficiently to accommodate 10 pieces of plate, one on top of the other,



Fig. 9.—Cooling Beds, Looking Toward Shears.

of the same type as No. 1, as illustrated in Fig. 10. The trim from the plates is cut up in a scrap shear built by the United Engineering & Foundry Company.

The stock building at the west end of the mill is 392 ft. long and 100 ft. wide. It is spanned by two 15-ton cranes, equipped with lifting magnets of the plate-handling type. Three tracks enter this building, each affording loading trackage for several cars at one time.

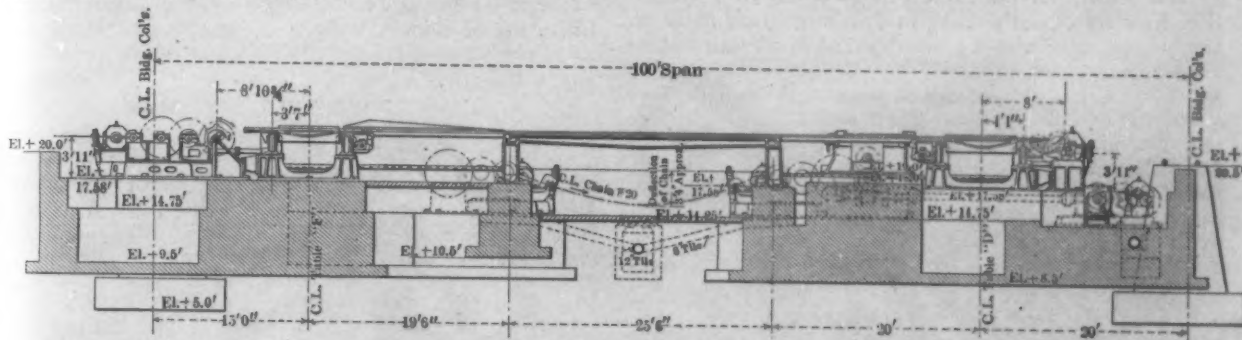


Fig. 8.—Cross-Section of Cooling Beds, Showing Jointed Table Design.

as they drop from the shear. These 10 pieces are then handled together to the transfer table, where they are set off on blocks for the convenient picking up by the crane. Shear No. 1 receives universal plates only. When sheared plates are being rolled they pass through the roller straightener only and from there in a straight line to shear No. 2, where the original plate is cut in lengths. These pieces are then delivered on castor plates to shear No. 3, which is a side shear. Both No. 2 and No. 3 shears were built by the Morgan Engineering Company and are

Mention should be made of the work of the Safety Commission in the equipment of the plant. By means of galleries, railings, shields and covers, danger for the careful employee is eliminated to a truly remarkable extent as compared with conditions existing only a few years ago. Precautions for safety and expenditures in this direction are justifiable in dollars and cents reasoning, for no other form of liability insurance can show equal returns.

Fig. 12 is a view of the gas producer plant consisting



Fig. 10.—Shear No. 1 for Cutting Universal Plates, Looking Toward Cooling Beds.

of eight Hughes mechanical gas producers. Coal is brought to the plant and discharged into concrete track hoppers outside of the building, from which hoppers the coal slides through gates into a pit running the length of the building. An elevator leg carries the coal up to a traveling hopper above the producers and in this way fuel is fed to each unit as required. The producer plant will be largely auxiliary, as a gas main bringing coke-oven gas is nearly completed and the expectation is to feed the reheating furnaces with coke-oven gas.

### The American Boiler Manufacturers' Meeting

The annual convention of the American Boiler Manufacturers' Association will be held at the Hotel Brunswick, Boston, Mass., July 10 to 13. The Boston entertainment committee of the New England Association of Boiler Manufacturers will consist of Duncan D. Russell, James Russell Boiler Works, South Boston, Mass., chairman; James E. Linch, Hodge Boiler Works, East Boston, treasurer; Joseph M. Robinson, Atlantic Works, East Boston; James C. Stewart, Stewart Boiler Works, Worcester; George F. Lawley, George Lawley's Son Corporation, Boston. The supply men's auxiliary committee will consist of Harry G. Porch, Lukens Iron & Steel Company; Wilbur Sargent Lick, Carnegie Steel Company; George H. Lloyds, Central Iron & Steel Company; James J. Sullivan, Champion Rivet Company; James L. Towle, Chicago Pneumatic Tool Company; James J. Killelea, Worth Bros. Company; Columbus Dill, Ashton Valve Company; George F. Musgraves, Star Brass Company. Frederick B. Slocum, Continental Iron Works, Brooklyn, N. Y., chairman of transportation committee, will take care of all reservations for accommodations at steamship lines between New York and Boston, if notified immediately.

### Promotion of Engineering Education

The Society for the Promotion of Engineering Education holds its annual meeting in Pittsburgh June 26 to 28, and in connection with it a handbook of Pittsburgh and its notable engineering works has been prepared. It takes the form of a 48-page booklet profusely illustrated, with descriptions of the different plants to serve as a satisfactory reminder of the points of interest visited. As usual, periods between sessions are reserved for different excursions, including one to the Homestead Works of the Carnegie Steel Company and others to the Pittsburgh branch of the United States Bureau of Mines, Jones & Laughlin Steel Company, Mesta Machine Company, National Tube Company, Westinghouse Electric & Mfg. Company, and Westinghouse Machine Company.

Among the papers scheduled is one by Prof. Fred. Raymond, for the Tuesday morning meeting, on the preparation of written papers in engineering schools; for the afternoon session, a report of the committee on teaching mathematics to engineering students by Prof. E. V. Huntington, and another for the same session on the balance of courses in chemical engineering by Dean C. H. Benjamin; one for the Thursday morning session on electrical engineering instruction by Prof. E. B. Paine. On Tuesday

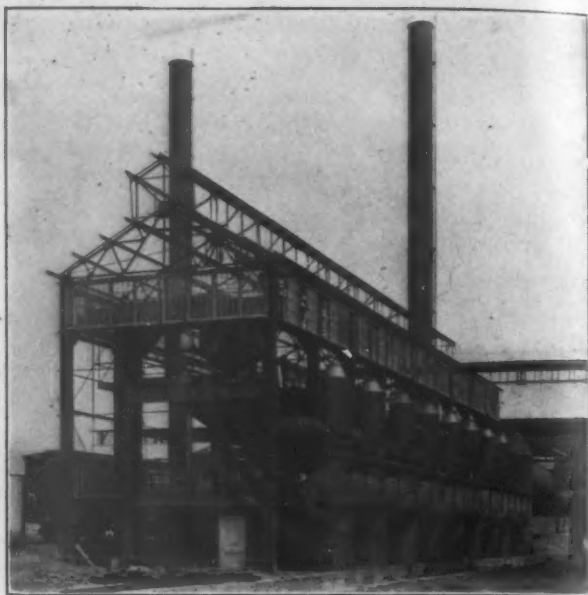


Fig. 12.—The Gas Producer Plant.

evening a dinner is to be tendered to the visitors at the Country Club by Director Hamerschlag in behalf of the Carnegie Technical Schools. Prof. A. N. Talbot, of the University of Illinois, Urbana, Ill., is president of the society, and Prof. H. H. Norris, Cornell University, Ithaca, N. Y., is secretary.

George H. Hull, president of the American Pig Iron Storage Warrant Company, 44 Wall street, New York, has in preparation a work which he will entitle "Industrial Depressions: Analysis of Causes, Classification and a Practical Remedy." The work will have diagrams, tables and appendices and will be published by the Frederick A. Stokes Company, 443-449 Fourth avenue, New York City. The price will be \$2.95. In this work Mr. Hull will show that if proper statistics were gathered and quickly disseminated, and the business world educated to a knowledge of their meaning, the course of trade could be steadied and calamities avoided.

Reports appear to be untrue that a large foundry to make ingot molds is to be built in the Youngstown district in Ohio, to use molten metal to be supplied by merchant blast furnaces in the Mahoning Valley.



Fig. 11.—View of Shears Nos. 2 and 3 of 60-in. Universal Plate Mill at Gary, Ind.



## New Indicating Boiler Flow Meter

For indicating the total amount of steam generated at any instant by one or a battery of boilers either in pounds of steam per hour or in boiler horsepower the General Electric Company, Schenectady, N. Y., has developed a new boiler meter known as the FS-2. For this reason it can be used advantageously for obtaining data for equalizing the load on the individual boilers of a battery, for determining the efficiency of the firing, whether the feed water is circulating correctly or not, for determining the losses in efficiency due to the formation of the scale, detecting internal leaks and indicating the amount of steam distributed to the different departments of a manufacturing plant.

The apparatus consists of a nozzle plug, the meter proper and the necessary pipes for connecting the two parts. The first is similar to that used with the steam and air flow meters which were illustrated in *The Iron Age*, May 26, 1910. It consists of a screw plug with a stem having two sets of orifices, a leading set arranged longitudinally and a trailing set comprising three holes located at the middle of the stem at right angles to the leading set. The interior of the stem is divided longitudinally into two separate compartments, connecting with the leading and the trailing orifices respectively. In operation the plug is screwed into a small hole drilled and tapped in the steam pipe with the leading set of orifices facing the direction of the steam flow. The impingement of the steam against these openings produces a difference in pressure in two sets of orifices which is communicated to the meter.

The meter proper consists of an iron casting cored out to form one leg and the well of a U tube, the other leg being formed by one of the pipes connecting the nozzle plug and entering the well at the opposite end. This well is filled with mercury while the rest of the apparatus is filled with water. The difference in pressure as transmitted from the nozzle plug causes a difference in the mercury level and the displacement of the mercury actuates a pulley through a small float suspended by a silken cord. The motion of the pulley is transmitted to the indicating needle

through a pair of horseshoe magnets, one of which is attached to the pulley shaft and the other to the indicating needle. The axes of rotation of the two magnets are in line and the mutual attraction exerted through a copper plug screwed into the side of the meter body casting compels them to move in unison.

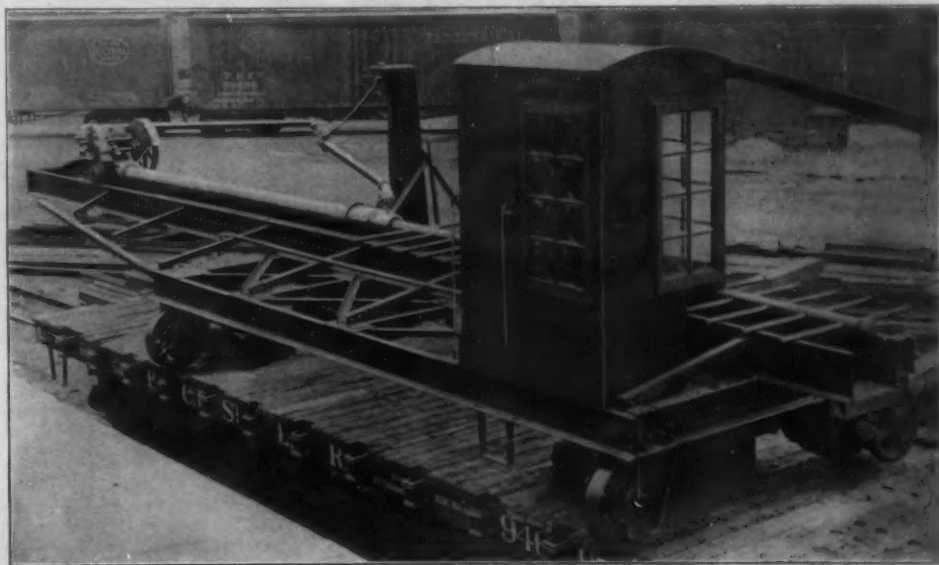
It is a comparatively simple matter to install the meter without interfering in any way with the existing steam pipe arrangement, since all that is required is the drilling and tapping of a small hole in the steam pipe for the insertion of the nozzle plug. The plug can be inserted in either a vertical or horizontal run of pipe, but a straight run of at least 12 pipe diameters in length should be selected. The meter is connected to the nozzle plug with  $\frac{1}{4}$ -in. iron pipe and can be located in any desired place provided it is below the plug, although the location recommended is on front of the boiler.

The dial is 8 in. in diameter and is marked with heavy flow lines and large figures on a white surface for easy reading. For designating a certain flow on this scale a conspicuous target which can be readily set from the outside is provided. The meter can be calibrated to read in pounds of steam per hour or in boiler horsepower on the basis of 30 lb. per hour is equal to boiler horsepower, for pressures ranging from 0 to 250 lb. gauge and from quality ranging from 4 per cent. moisture to 260 deg. F. superheat. The pipe diameters for which meters can be supplied range from 2 to 14 in.

## A Mechanical Coke Quencher

The problem of quenching coke mechanically in rectangular ovens has presented a number of difficulties. These include the providing of means for the rapid and efficient quenching of the coke in the ovens without injuring the oven walls, and to overcome this difficulty the C. O. Bartlett & Snow Company, Cleveland, Ohio, has recently completed a coke quenching machine from a design patented by the late John W. Seaver of that city. This machine was installed at the plant of the Mt. Hope Coke Company, Linn Station, near Brownsville, Pa., and the photograph from which the accompanying engraving was reproduced shows the quencher mounted on a freight car in the yard of the builder's plant.

The construction of this machine is rigid and in general resembles that of an electric traveling crane. All the parts are of heavy construction and the steel castings are of ample proportions. Throughout the entire design care has been taken to secure a machine capable of being built at a comparatively low figure. The essential parts of the quencher are two in number, an overhanging pipe and the main frame. The latter is mounted on trucks which travel on the tracks carrying the pushers, the entire oven being quenched from the pusher end. The overhanging pipe which is mounted on the frame is carried on a self-propelling trolley. As is clearly shown at the left of the engraving the axles of the trolley wheels are connected through gearing to an electric motor. This pipe has quenching arms which are so arranged that the entire



A New Coke Quenching Machine for Rectangular Ovens Built by the C. O. Bartlett & Sons Company, Cleveland, Ohio.

oven or any portion can be quenched as desired, the arms being spaced and perforated with this object in view. The pipe when extended to its full limit projects 39 ft. from the end of the frame, this distance being sufficient to enable it to take in the entire width of the oven. In addition to this longitudinal movement the height can also be adjusted to enable the machine to be used for quenching either 48 or 72 hr. coke. The water is supplied from the main pipe line of the plant through outlets spaced 60 in. on centers along the front of the oven. A 3-in. hose attached to these outlets connects with the main frame, which in turn is connected to the overhanging pipe through a pair of swiveling pipes.

Two electric motors are used to operate the machine, one for traveling the machine along the tracks and the other for moving the overhanging pipe trolley back and forth on the main frame. Both of these motors are controlled from a cab which can be located on the frame in the most convenient position. It is stated that the service given by the machine has been very satisfactory, and that it is possible to quench 72-hr. coke in from 5 min. to 6 min. and 48-hr. coke in from 3 min. to 4 min.

Reports from the sheet metal working concerns in Canton, Ohio, show an improvement in orders for ceilings, roofings and other products, and the plants are now generally fairly busy.

## The Steel Corporation Investigation

### Examination of James Gayley Continued

James Gayley was again before the Stanley committee, June 13, as his examination had not been concluded June 9. On this day the line of questioning bore on the subject of agreements in the steel rail trade before and after the formation of the United States Steel Corporation.

#### Agreements in the Steel Trade Before 1901

Replying to an interrogation, Mr. Gayley said that prior to 1901 there were agreements by which manufacturers were apportioned certain shares of the steel business, and those who failed to get their allotted shares were taken care of with a proportion of the general profits.

He declared that for a long time before 1897 the price of steel rails was practically uniform at \$28 a ton. It represented an understanding between manufacturers of rails and the railroads as to an equitable price. He said a fraternal feeling had always existed between the rail makers because of a desire to produce the best possible rails.

Being asked as to whether there was competition in rail-making at the time he was connected with the Carnegie Steel Company before the merger with the Steel Corporation, he said there had always been competition.

Asked what caused the sudden drop in the price of rails in 1897, he said it was because the Illinois Steel Company cut the price from \$28 a ton to \$17, and that this cut was made in retaliation for a fancied wrong by the Carnegie Steel Company. He was unable to say what the Carnegie Company had done to arouse the anger of the Illinois Company.

Mr. Gayley admitted that previous to 1900 agreements were made between the various manufacturers, in which the Carnegie Company participated. These agreements provided fines for violations.

"What body imposed the fines?" Representative Young asked.

"I do not know," Mr. Gayley replied.

"To whom were the fines paid?"

"I imagine that they were divided pro rata among the different companies."

When asked who could explain the agreements and fines, Mr. Gayley said he presumed Charles H. Schwab, the president, or E. A. Peacock, the vice-president, of the Carnegie Company, could tell. Mr. Gayley further admitted that before 1900 there were agreements as to the proportions of business each manufacturer was to have.

"If the companies did not get their share," asked Mr. Young, "were they given the profits anyway?"

"That is my understanding of it."

#### No Agreements in the Past Ten Years

"Have such agreements been enforced in the past ten years?"

"I have never heard of any."

"When were these agreements in force?"

"Prior to 1900."

"Was this change in method caused by the organization of the Steel Corporation?"

"It may have been the natural result of that organization."

"Was that so because the necessity for agreements had disappeared?"

"It was because of the great improvement in trade; there was business enough for all."

Stability of prices after the formation of the Steel Corporation, Mr. Gayley said, was effected through the influence of the corporation. The corporation, he insisted, was not in a position to enforce an understanding, but its advice was at all times likely to be heeded by iron and steel men irrespective of their business affiliations.

"I was brought up in the school of keen competition," Mr. Gayley testified. "Judge Gary promulgated the idea that competition was unprofitable. He was opposed to the old method of going out into the market and slashing prices in order to get business. Personally I was opposed at the outset to the views of Judge Gary. I had been trained under the old competitive conditions. I was finally won over to the new plan."

Mr. Gayley said that the United States Steel Corporation would not reduce rates in rails to meet a cut.

"Do I understand," asked Representative Gardner, "that if a competitor reduced its rate on rails to \$26 a ton United States Steel would still hold its price at \$28 a ton?"

"Yes."

"How do you explain that?"

"Simply that the corporation will not give its valuable raw material away."

"In your opinion," asked Mr. Gardner, "so long as a rail maker adheres to the price of \$28 he is in no danger of having his allotment of business cut down?"

"I have no knowledge whatever of there being any apportionment of the steel rail orders of the country," answered Mr. Gayley.

#### The Cost of Producing Steel Rails

Mr. Gayley's examination on the following day, June 14, was partly with regard to the cost of producing steel rails. He told the committee that the cost, including all elements, approximated a little more than \$22 a ton.

Representative Bartlett said that some years ago, in a letter addressed to the Ways and Means Committee, Charles M. Schwab made the statement that steel rails could be made at a mill cost of \$12 a ton, and asked:

"Do you agree with Mr. Schwab in this conclusion?"

"I never believed Mr. Schwab could do it," replied Mr. Gayley. "I asked him once how he proposed to do it, and Schwab just smiled."

Mr. Gayley testified that rail prices have been uniform since the organization of the Steel Corporation.

"The price varied prior to that time," he said. "The present price—\$28 a ton—is fixed by mutual conclusion between the steel makers and the railroads. Each side agreed that the price was a fair one."

"Do you know whether there is an agreement, international in its purpose, by which business is parceled out?"

"I have never heard of any."

"If such an agreement is in effect the president of your company would know all about it?"

"He would."

Representative Bartlett said he would question President Farrell on this subject later.

Mr. Gayley was questioned as to the value of the Carnegie property prior to its absorption. His attention was called to a statement he made at the trial of the case of Henry C. Frick against Andrew Carnegie and other officers of the old company. He testified at the trial that in 1899 the assets of the Carnegie Company were worth \$250,000,000.

"That was my belief as to the value of the property at that time," answered Mr. Gayley. He added: "Mr. Carnegie often said that the greatest asset of his company was the personnel of the organization."

#### Progressive Policies of the Carnegie Company Still Followed

Mr. Gayley insisted that the progressive policies of the Carnegie Company in adopting improved methods or patented devices and employing high-class executive skill and superior labor were followed by the Steel Corporation. This statement was brought out as a result of questions by Chairman Stanley that seemed to present a contrast between the methods of the two companies.

He gave to the committee many details about the ore holdings and shipping facilities of the Steel Corporation. Being asked to explain prices of rails quoted to the Canadian Pacific Railroad, prices lower since 1901 than the uniform domestic rate of \$28 a ton, he suggested that the question be referred to President Farrell.

Mr. Gayley described at length the steel war which occurred in 1897 and 1899, during which steel rail prices varied, dropping as low as to \$17 a ton.

"Did not that steel war in 1897 and 1899 bring about the organization of the United States Steel Corporation?" Representative Bartlett asked.

"I do not think it had anything to do with it. It may have had an effect on the formation of the Federal Steel Company, organized just before the Steel Corporation was formed."

"Do you know whether or not there is an agreement now between steel rail manufacturers whereby territory is parceled out?"

"I do not. If such existed, President Farrell could tell you."

Mr. Stanley pressed the inquiry into the old agreements, seeking to discover how they had been superseded.



"The old agreements often were broken," Mr. Gayley replied, "and in those days price cutting came about as retaliation for some fancied wrong."

"Since the formation of the Steel Corporation have there been no fancied wrongs and no efforts on the part of the manufacturers to reduce prices?"

"There have not," was the emphatic reply. "Manufacturers of steel to-day have been brought more closely together. They are getting better acquainted, and there is more freedom of intercourse that has created a better understanding. Everything is done openly and frankly now, whereas before each manufacturer worked secretly."

#### The Steel Corporation's Ore Freight Rates

R. V. Lindabury, counsel for the Steel Corporation before the committee, had a brush with Chairman Stanley over the introduction of some railroad rate figures relating to the Steel Corporation's railroads in the Lake Superior ore region. The chairman had obtained rates per ton on ore hauled by the Duluth & Iron Range and the Duluth, Mesaba & Northern from the Interstate Commerce Commission, and had employed an engineer to compute from these figures the rate per ton per mile. The purpose was to show that the rates charged for hauling ore over the Steel Corporation's roads were exorbitant. The charges, he said, were paid from one Steel Corporation pocket to the other, but resulted in unjust cost to independent owners, and thus increased unfairly their cost of production. Mr. Lindabury objected to the introduction of the figures computed without the disclosure of the identity of their author.

Mr. Stanley said the author was an engineer and expert accountant, formerly in the service of the Carnegie Company and the Steel Corporation, whom he had employed to make the mathematical calculations. He said also that he was "responsible for the figures. If they are wrong they may be corrected."

Mr. Lindabury stated to the committee that the Steel Corporation intends to suggest to it the calling of witnesses whom the committee may overlook and who may throw light upon matters in question in the inquiry, and also to suggest that questions be asked of certain witnesses, if the committee fails to bring out facts known to such witnesses.

"The committee will exercise its discretion as to whom it will summon," said Chairman Stanley.

It is expected that President James A. Farrell will be the next witness to be called, probably the latter part of this week.

### Lake Superior Ore Explorations

MARQUETTE, MICH., June 17, 1911.—The exploring concern which is testing the lands of the Michigan Land & Iron Company in the Witch Lake district, south of Republic, Marquette range, for the United States Steel Corporation, is enlarging its operations. To the four diamond drills previously in commission, two more are being added. Day and night crews are employed. A great deal of interest centers in this work, since, if ore is found, as is expected by many mining men, a new field will be opened and much will have been accomplished in determining the mineral value of the big stretch of country between the Marquette and Menominee ranges.

The Iron River Ore Company, a local concern, is planning to undertake considerable drilling in the Iron River district of the Menominee. It has under option a number of tracts, presumably well located on the iron-bearing formation. It is estimated in this connection that during the past five years in the neighborhood of 1000 drill holes have been sunk in the field, ranging all the way from 100 to nearly 2000 ft. in depth, and that the aggregate expenditure has been probably \$750,000, and even more. Much of the work was barren of results. Much, too, was successful, and all told millions of tons of ore have been located. John T. Jones, Iron Mountain, operating the Ardis "step" furnace, is president of the Iron River Ore Company; Clarence McDermott, of the Huron Mining Company, is vice-president, and J. B. Weimer, Iron River, is secretary and treasurer.

In the neighborhood of a dozen new concerns are conducting exploratory or development work on the Vermilion range, and it is the claim of a number of these that the opening of profitable mines is assured. Doubtless of

significance in this connection is the installation of costly surface plans. Independent interests, which are reopening a portion of the Chandler mine at Ely, abandoned by the Steel Corporation two years ago, already have accumulated a stockpile of good size. The ore is of high grade, and it is asserted there are fully half a million tons yet to be taken out. The deposit is one that was located when the Chandler was first wrought many years ago, but which was lost sight of in the operations incidental to the adoption of the caving system of mining. The Section Thirty property, a new shipper last season, has made some good sales and at present is shipping at the rate of 20,000 tons monthly.

A number of officials and directors of the Josephine Iron Company and the Catherine Mining & Exploration Company, controlled at Cleveland and Pittsburgh, have recently visited their holdings west of Michigamme, Marquette range, as a result of which the operations under way have been enlarged. The companies control lands in Section 23, formerly known as the Steward property, and are exploring them. Both drilling and test-pitting are being done. Ore has been found apparently in considerable quantity and it is expected that development work later on will be pushed vigorously. Among those in the visiting party were Albert Graham, president Graham Nut & Bolt Company; J. B. Yohe, Pittsburgh & Lake Erie Railroad; Frank Parrish, American Bridge Company, and J. J. Lanahan, Pittsburgh.

The Jones furnace interests have a force of 30 or 40 men at work at the Kloman mine, in the Republic district of the Marquette range. A shafthouse is being erected, but the principal operations are those connected with the installation of three step-process furnaces of the Jones type. It is expected to have these plants in commission early in August. A considerable quantity of metallized ore, which will be the product of the furnaces, has been contracted for delivery this season. It is these furnaces that are expected to make the lean ores of the Lake Superior region valuable, and great interest attaches to the results of their operation.

At least two more iron mines are to be opened in the western portion of the Marquette range within the next few years. This is assured as a result of the decision of the North Range Mineral Land Company to lease to operating concerns two valuable tracts west of the American property of M. A. Hanna & Co. These tracts have been explored by diamond drills and are known to contain large bodies of ore. Further exploratory work will be undertaken shortly, and it is not at all improbable that the development of other mines will be the outcome.

The North Lake Company has only recently been organized. It is capitalized at \$500,000. George J. Maas, Negaunee, Mich., is the president, and associated with him in the directorate are R. J. Maas, T. C. Yates, W. J. Maas and J. H. Winter of Negaunee, A. E. Maas of Milwaukee and Joseph Croze, of Houghton, Mich. One diamond drill hole put down in Section 38 is the deepest ever bored in America. From surface to the bottom it measures 3265 ft.

A heavy locomotive truck spring bent or reversed through its own camber was a phenomenon witnessed at the Master Mechanics' and Master Car Builders' convention at Atlantic City, N. J., apparatus for the purpose being exhibited by the Carnegie Steel Company. While it is recognized that no spring is subjected to this kind of treatment in actual service, the test was regarded as proving that a vanadium steel spring is capable of meeting unusual conditions without destruction or impairment of its properties as a spring. Part of the Carnegie exhibit was in the space of the American Vanadium Company, and numerous other interesting results secured from various types of vanadium steel were shown.

The Canton Foundry & Machine Company, Canton, Ohio, has been reorganized. W. J. Peyser, formerly vice-president, is now president and sales manager. A. O. Slentz, formerly general manager, is now also vice-president. W. H. Cavnah, who was president and treasurer, is now secretary and treasurer. W. S. Yohe, the former secretary, has retired from the company and will engage in the factory supply business in Canton. The company reports an active demand for sheet metal machinery. Among recent orders received was one from Manila, Philippine Islands, and another from Durbin, South Africa.

## The Küppers Gas Producer

### A German Producer with Revolving Grate and Revolving Shaft

In the issue of *Stahl und Eisen* for April 20, 1911, a description is given of a new gas producer. It is written by Dr. Mardus of the Peine Steel Works, where the original producer has been in successful operation for some time. A translation in abstract is given below.

The producers that at the present time seem to fulfill the requirements most successfully are of the revolving grate type. These have a capacity of from 14 to 16 metric tons in 24 hours, with an internal diameter of about 8½ ft. The larger number of different kinds of these producers show material differences only in the design of the grate. The Küppers producer is claimed to present important advance. Its internal diameter is 8 ft. 4¾ in.

Fig. 1 shows the internal construction of the producer. It may be seen that not alone the grate but also the lower

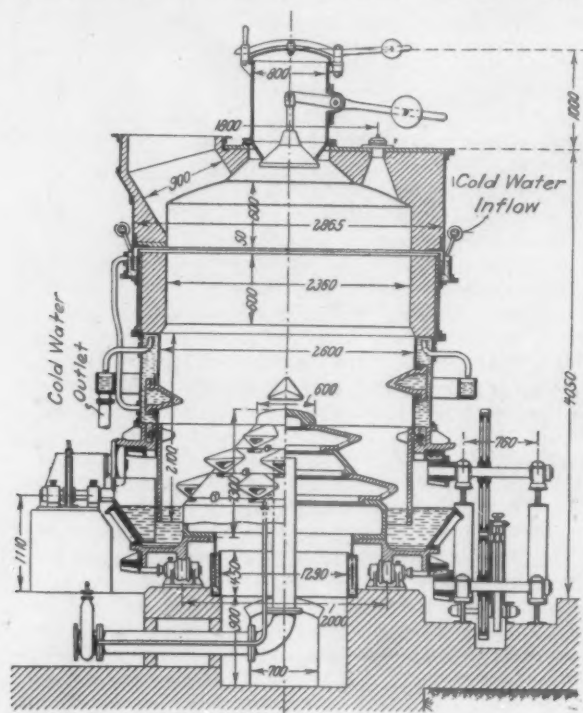


Fig. 1.—Section of the Küppers Gas Producer. Dimensions Are in Millimeters.

part of the shaft is rotated, the rotation being in opposite directions. Through this double movement, the column of fuel remains at rest. The upper part of the shaft is of the usual construction, and is rigidly connected to the bell and hopper. There is a water seal between the upper and lower parts of the shaft, that also serves as a cold water tank for the double water-cooled casing of the lower rotating part.

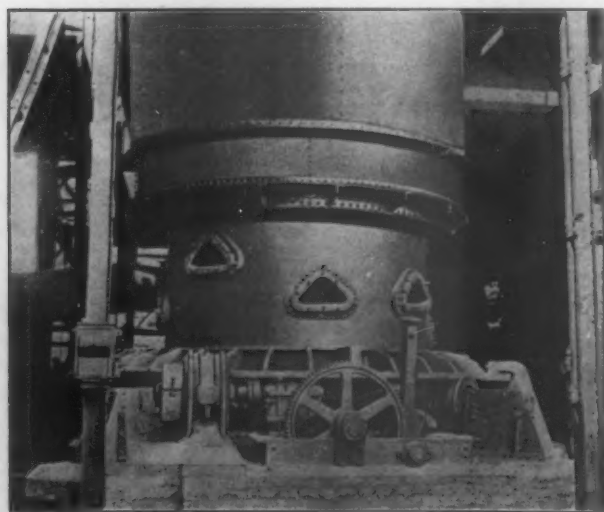


Fig. 2.—The Rotating Mechanism of the Küppers Gas Producer.

This carries several knife-like water-cooled projections that reach into the producer. These "slag knives," as they are called, are arranged in a slowly ascending spiral, and, with the movement of the shaft, exert a certain pressure vertically downward on the material near to them. The outer casing is made in several parts, which can be removed. This makes the knives easily accessible, should changes or repairs become necessary. The lower part of the shaft, Fig. 2, is rigidly connected to a very strong cast-iron ring resting on several rollers. This ring, in its turn, is connected to a toothed ring, through which the turning movement is made. The rollers carrying the shaft are made with wide flanges, that insure a good centering during the turning movement.

The cone-shaped symmetrical grate is formed of separate cast-iron rings, bolted together. It is shown in Fig. 3. The grate has similar knife-shaped projections to the casing that are staggered, as may be plainly seen in the illustration. To prevent them from burning off, the air and steam mixture is blown through the hollow part of the grate and through slots near the under surfaces of the knives. The air and steam mixture is also blown through holes distributed over the entire surface. The head of the grate has no openings. The real body of the grate is provided with a support and an ash pit in which water is always kept. The lower part of the shaft dips into this ash pit. The whole rotating system—grate, support and ash pit—rests on a bearing ring that in its turn rests on rollers. The ashes are removed in the usual way by a shovel fixed in the ash pit.

The openings over the whole surface of the grate give a very uniform distribution of air over the entire section of the producer. The tests have shown that these openings are so situated that they are not stopped up with ashes. The operation of the knives gives a porous fuel bed, whereby the carbon and oxygen can come into very intimate contact, and gasification can take place most actively. The column of fuel can slip down of itself, without finding great resistance, which brings about large fuel consumption. The results of several weeks' run at Peine in 1910 are given in the table herewith.

Date.	Time.	CO <sub>2</sub>	C <sub>2</sub> H <sub>4</sub>	O	CO	H	CH <sub>4</sub>
Dec. 6.	10:30 a. m.	4.0	0.1	0.3	25.4	10.9	1.4
Dec. 8.	2:30 p. m.	3.0	0.2	0.2	29.8	11.0	2.0
"	3:55 p. m.	5.3	0.2	0.3	23.0	8.5	2.1
Dec. 9.	9:35 a. m.	3.8	0.2	0.2	24.8	9.9	2.8
"	2:30 p. m.	2.7	0.2	0.1	28.9	11.6	2.4
"	3:55 p. m.	3.0	0.2	0.1	28.1	9.6	1.7
Dec. 10.	9:25 a. m.	3.0	0.4	..	28.4	12.6	2.0
"	2:35 p. m.	3.1	0.4	0.2	27.3	13.1	1.7
"	4:50 p. m.	2.7	0.2	0.2	28.8	12.2	2.0
Dec. 12.	10:00 a. m.	4.0	0.3	0.1	26.4	15.2	2.1
"	2:25 p. m.	4.4	1.2	0.3	26.8	11.3	1.7
"	4:05 p. m.	4.2	0.4	0.2	27.0	10.6	2.0
Dec. 13.	9:50 a. m.	2.7	0.4	0.2	29.1	13.2	2.0
"	2:30 p. m.	3.7	0.2	0.2	27.1	14.1	1.7
"	4:00 p. m.	4.0	0.3	0.1	27.0	13.7	1.7
Dec. 14.	10:10 a. m.	2.2	0.4	0.2	29.7	11.2	2.0
"	2:15 p. m.	2.0	0.4	0.3	30.2	10.4	2.3
"	3:55 p. m.	2.6	0.4	0.3	29.3	10.2	2.7
Dec. 15.	9:20 a. m.	2.6	0.4	0.4	29.6	9.2	2.2
"	2:10 p. m.	4.0	0.4	0.2	27.1	12.9	1.7
"	4:05 p. m.	2.2	0.4	0.2	30.1	10.9	2.7
Dec. 16.	9:30 a. m.	3.6	0.4	0.4	29.0	10.8	2.0
"	9:35 a. m.	3.3	0.5	0.4	28.8	10.7	1.7
"	2:10 p. m.	5.2	0.4	0.2	24.8	11.1	2.1
"	2:20 p. m.	2.3	0.4	0.3	29.6	12.4	2.0
Dec. 17.	9:40 a. m.	3.4	0.4	0.3	27.6	10.5	1.7
"	2:05 p. m.	2.8	0.4	0.3	28.7	14.9	2.0
Dec. 19.	9:35 a. m.	4.0	0.4	0.3	27.5	10.4	1.7
"	9:40 a. m.	4.7	0.3	0.2	26.2	10.3	1.7
"	2:35 p. m.	4.0	0.4	0.3	26.4	11.2	2.1
Dec. 20.	10:15 a. m.	2.4	0.4	0.2	30.0	9.8	2.3
"	3:20 p. m.	2.3	0.4	0.2	29.9	12.8	2.0
Dec. 21.	11:10 a. m.	5.4	0.4	0.2	24.0	9.3	2.1
"	2:45 p. m.	5.7	1.4	0.2	23.6	9.5	1.4
Dec. 22.	9:35 a. m.	2.8	0.3	0.3	28.8	9.7	2.0
"	2:35 p. m.	2.7	0.4	0.1	29.2	11.1	2.4
Dec. 23.	9:40 a. m.	3.0	0.5	0.1	28.6	11.2	2.4
"	2:35 p. m.	3.0	0.4	0.2	29.0	10.3	2.7

The fuel used was a mixture of English and Westphalian coal, the proportions being from 1:1 to 1:2. The English coal was a non-caking lean variety with about 10 per cent. ash, and so much dust that the mixture had from 30 to 40 per cent. The Westphalian coal was a strongly caking, good gas coal with from 7 to 8 per cent. ash. The average air blast pressure was 2½ oz. per sq. in. The heat value of the gas was 157.3 B.t.u. per cu. ft. The highest moisture content was 9.74 gr. per cu. ft., and the lowest 7.65. The coal consumed was 22 to 24 metric tons in 24 hours, which was increased when necessary to 26 or 28 tons. The ash was said to be free from combustion constituents.

The speed of rotation of the two movable parts, grate and shaft, was fixed in proper relation to the amount of



ash in the fuel. It amounted to 4 or 5 revolutions in 24 hours. The power required was 2.2 hp. The amount of poking required was very small, and was restricted to the upper part of the fuel bed. On this account the pokers could be made shorter, lighter and easier to handle. The steam addition could be so regulated that the gas, containing 10 to 11 per cent. hydrogen, only had from 7.65 to 9.74 gr. of moisture per cu. ft. The low moisture is proof of the intimate contact of the air and steam mixture with the fuel and the even porosity of the fuel bed.

The producer served a 35-ton open-hearth furnace, and the proportion of pig iron in the charge was lowered from



Fig. 3.—The Grate of the Küppers Gas Producer.

22 to 18 per cent. At the time that necessary repairs were made to the open-hearth furnace, the producer was cooled down and emptied sufficiently to examine the upper part of the grate. The openings for the air and steam were found to be entirely open and no burning away was noticed, showing that the cooling by the air and steam was sufficient.

The following advantages are claimed for the Küppers producer, based on the tests:

1. Large amount of coal can be gasified.
2. Uniform gasification with uniform and good composition of the gas produced.
3. Continuous and automatic removal of the ash.
4. Great efficiency of operation and very simple and greatly lowered hand labor.
5. Very complete consumption of the fuel.

G. B. W.

## Needed Standard for Sheet Steel

### A Feature of President Souther's Address Before the Society of Automobile Engineers

In his presidential address before the Society of Automobile Engineers, at Dayton, Ohio, June 15, Henry Souther, of the Henry Souther Engineering Company, Hartford, Conn., dwelt at length on the work of the sheet steel division of the society, and the old question which the committee had stirred up in respect to the finding and adoption of a metal gauge.

There exist in widespread use six systems of gauges, he explained, and several others are used to some extent. There is a general recognition of the necessity of a gauge rather than of naming of thickness by inches or fractions thereof. Those deeply in the rut in the use of gauges cannot conceive of any means of getting away from such use. They see complication rather than simplicity if gauges are abandoned, and state that were gauges abandoned the number of different thicknesses called for would increase and that the number of dies or rolls or mandrels necessary to produce wires, sheets or tubes would increase enormously.

President Souther said that, after reading the voluminous correspondence relating to the committee work, he

thought an adoption of standard differences between thicknesses might eliminate the necessity for a gauge. Material ordered not conforming to these differences would then be special material, not of standard thickness and therefore of special price.

#### Basis for Thickness Measurements

There seems to be no good reason, he suggested, why 0.001 in. should not be the basis of all measurements relating to the thickness of sheets, wire or tubular metal. It might be necessary to refer to nine hundred thousandths thick at one extreme of the table and perhaps split thousandths at the other extreme, but this would be the exception rather than the rule, and little hardship even at that.

It is a fact that the gauges in common use are founded on different principles; one, for example, especially for metals like copper, brass and the like; another, based upon the weight of a given area of sheet metal, and another upon measurement in fractions of an inch. There seems to be no good reason why one system of measurement or gauge, if a gauge be necessary, should not apply to all kinds of metal, whether copper, aluminum, iron, or steel, in sheet, wire or tubular form.

In considering the whole subject, Mr. Souther continued, one is led to the thought that all interests in the United States should be consulted; the engineering societies, the large manufacturers of wire and sheet metal, the large users of such materials and the government as an accepted authority for all standards. No decision would be worth the paper it was written upon without the support of all these interests.

#### The Need of an International Standard

Then the thought naturally leads to the desirability of an international conference. There are various gauges peculiar to European countries; but one is immediately confronted by the metric system—the standard of Europe—and an international standard seems out of the question without the added complication of a table of equivalents; English to metric, inches to millimeters. Our producers of metal are obliged to know the foreign gauges because they export much material to foreign markets. Consequently even though an American standard be adopted, it will be only an incomplete standard after all; not international.

To get action, he emphasized that all in the United States interested should push to a point ready for adoption a system of naming thickness, and that, when such a system is agreed upon by all concerned, the results be used to replace all other means of measurement where the English measure is standard. Rather than attempting to start an international system, it was his belief that if some report on some standard be offered for adoption quicker action would be obtained than trying to get all concerned to move forward at the same time.

#### Programme for Securing the Standard

The work properly started by the society may, when completed, be properly placed before the United States Government and the Bureau of Standards, and by that Bureau before the other interests involved in the United States. It is probable that some action could be obtained in a relatively short time by such a programme.

#### Society's Specifications for Iron and Steel

In referring to the iron and steel division of the society President Souther mentioned that specifications for engineers, to aid them in the proper selection of materials, and for purchasing agents, to assist them in the proper purchase of materials, have been supplied to the members. The specifications cover principally chemical analyses. The producer understands what the consumer wants, and the consumer ought to know what he wants before he places the order. There is no complication of physical requirements or anything else that could possibly be antagonistic to the chemical requirements.

In addition to the specifications as to chemical limits, instructions have been prepared as to heat treatments, definitions of terms relating to physical characteristics and general information. They are not to be coupled with the purchasing specifications proper. It is not possible to print anything that will answer without variation in every instance, but it is better to put these heat treatments before the members than to leave them in absolute ignorance.

## Air Compressor Regulation

Application Where a Large Number of Pneumatic Tools Are Regularly or Intermittently Used

BY C. A. TUPPER, MILWAUKEE, WIS.

In connection with the compressed air systems of any large foundry, machine shop, mine or quarry, there is usually provided an air reservoir supplied directly from the compressor plant and distributing it through various lines of piping to the pneumatic tools or other apparatus for which it is required. The demands made upon this receiver necessarily fluctuate. As, however, it is desirable to maintain a uniform working pressure for the tools, without developing one far above normal and allowing the excess to blow off, a regulator for the compressor is installed, so designed as to be immediately sensitive to any material drop in pressure within the

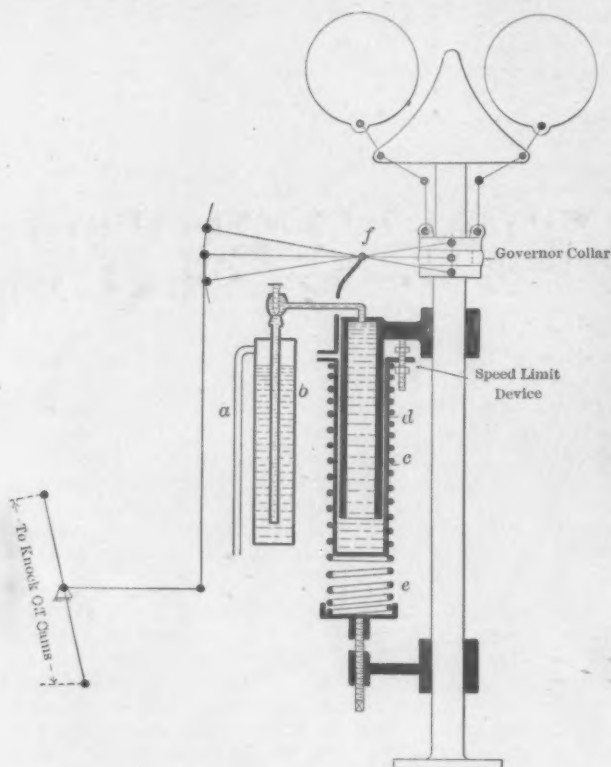


Fig. 1.—Details of a New Type of Pressure Regulator Used on Air Compressors Built by the Allis-Chalmers Company, Milwaukee, Wis.

receiver and at the same time to guard against an oversupply. The latter is the more difficult problem.

When the pressure exceeds the limit fixed for the system, the regulator operates to reduce the quantity of air supplied to the receiver by one or a combination of the following methods: Throttling the air inlet to the compressor, unloading, throttling the steam inlet to the engine, or causing an earlier cut-off in the steam cylinders of the engine. With the first of these methods, which is very uneconomical, and with the second, used mainly for blowing engines at smelters, the compressor or blower runs at constant speed; while, with the third and fourth the object is accomplished by varying speed of the unit to suit the pressure and the volume of air required.

In connection with the two last named, a number of leading compressor builders in the United States and Europe have recently been working along nearly parallel lines, with good results. The centrifugal ball governor and air pressure regulator illustrated herewith, which, when examined by the writers, were operating in the power plant of a large metal working establishment, afford a combination that illustrates clearly one very efficient means of solving the problem usually involved.

The regulator controls the speed of the compressor unit, and consequently the discharge pressure of the air delivered to the receiver, up to the limit determined upon, including an overlift; and if, for any reason, the speed should tend to rise above the last named limit, the gov-

ernor comes into play to prevent racing. The latter is a fly-ball governor, of improved design, driven by belt from the the main shaft, with the usual rods to the knock-off cams of the valve gear of the Corliss engine which forms the steam end of the compressor unit.

### Constructional and Operating Details

In Fig. 1 may be seen the details of this combination. Air pressure from the receiver is transmitted through the piping a, and an oil cylinder, b, to the oil contained in another cylinder, c, which is movable. This cylinder incloses a fixed piston, d. When pressed downward by the action of the air on the oil, the cylinder c meets a counter

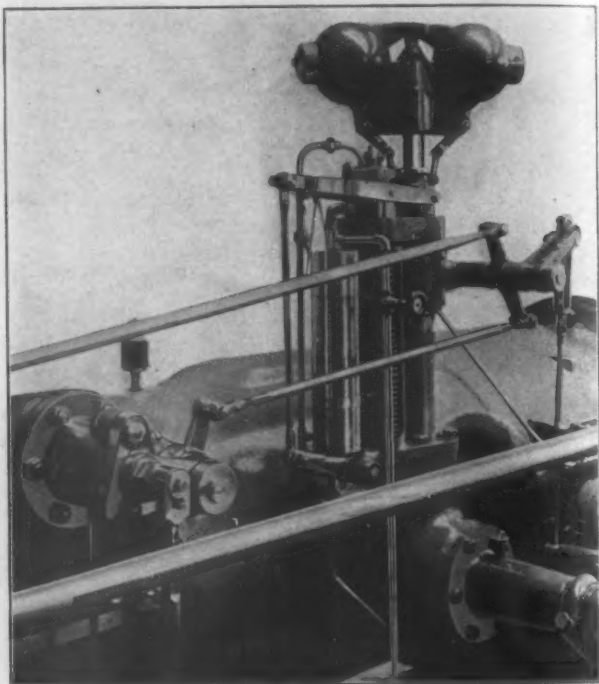


Fig. 2.—The Regulator in Position on an Engine.

pressure from a compression spring, e, which is placed around and underneath, thus forcing the cylinder back again as soon as the balance of the system has been restored by equalizing the pressure. The cylinder actuates, in turn, a floating lever, f, which is pivoted on its upper extremity and also attached to the cam rods. The position of the lever can be best observed in Fig. 2, which shows an installation of the regulation. If the demand for compressed air at the tools or elsewhere in the system is lessened, the receiver pressure will be increased to above normal, the cylinder inclosing the fixed piston will be depressed, taking with it the pivot point of the floating lever, and the latter, by its connection with the knock-off cams, causes an earlier cut-off in the steam cylinders, thus slowing down the entire compressor unit. In a similar

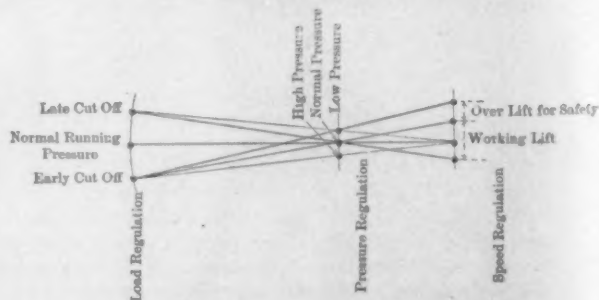


Fig. 3.—Diagram Showing Working of Floating Levers.

design the same object is effected by a movable piston and a fixed cylinder, the arrangement otherwise being practically the same. With slower speed, the regulator is restored to its normal position. When the pressure in the receiver falls off, so as to call for a greater supply of air and the consequent speeding up of the compressor unit, the action of the regulator is, of course, the reverse of that above indicated.



The movement of the floating lever, with the positions for normal running pressure, early or late cut-off and the working lift of the governor collar, overlift, etc., is diagrammatically shown in Fig. 3. This regulator has a wide range of speed, the variation being from about 10 to 1. Cards taken from compressors which have been equipped with it show that a variation of less than 2 per cent. of the air pressure is sufficient to change from full speed to practically no speed, and the control is so automatic as to require no attendance after the steam is once turned on. With the safety devices any running away of the engine is avoided, should an air pipe break or such an undue quantity of air be taken from the receiver as to cause an instant drop in pressure. The unit can be kept at the maximum speed, under full control, and run up to that point immediately after starting, without requiring the engineer to stand at the throttle and gradually allow pressure to develop.

The governor follows the same general principle as the Weiss governor, except that springs are used instead of weights and that the mechanism at its top position is very sensitive. The principal difference between this governor and former types of purely static governors lies in the separation of its stroke into two distinct divisions. The lower part, which controls the working revolutions of the engine, has such a range of movement for normal operating speed that the steam inlet valves are always under the complete control of the regulating mechanism, while the upper part only operates in case of an emergency likely to cause disaster. Static governors ordinarily have a safety stop, consisting of some such device as blocks or weights on the cut-off cams, which come into action in case the governor sleeve rises above the allowable maximum and thus shut off the admission of steam entirely. This arrangement is admirable where approximately constant speed is required but for ordinary air compressor service, with the frequent overloads and violent fluctuations incidental thereto, it is hardly dependable enough, as, by acting unexpectedly at inopportune moments, it is liable to cause derangement of the entire pneumatic system.

With the improved designs that are now current, mechanisms like the above have all of the advantages and none of the defects of the ordinary static governor, since as soon as the sleeve reaches the highest point for normal operation it holds the unit there as long as there is not the full required volume and pressure in the receiver, thereby securing maximum operating economy. One of the German firms which is working along these lines states that, with the use of its apparatus, the regulation can be so effected as to correspond exactly to the demands made upon the system at any time; that, under the control of the automatic governor, the compressor unit can neither run away or stand still, and that the discharge pressure is maintained at the desired volume without noticeable speed variation. Considerable emphasis is laid on the fact that its system is pseudo-astatic.

This comparatively recent development is also of interest for the reason that it foreshadows, both in the United States and Europe, still greater efficiency in the design and operation of compressed air plants. Until within a few years past, very little attention was paid in foundries, shops or mills to possible economies or increased efficiency in their pneumatic systems; but the largely extended scope of the latter has aroused greater interest in them and led to the working out of considerably modernized methods. It is recognized, however, that there is still room for betterment, all along the line, while taking due advantage of the improved designs and systems gradually brought out.

The Parkesburg Iron Company, Parkesburg, Pa., has twice recently been the unfortunate victim of bad proof-reading in the columns of *The Iron Age*. The name has been printed "Parkersburg" instead of "Parkesburg." The company manufactures charcoal iron boiler tubes and has been in existence nearly 40 years, so that it is thoroughly known in the iron trade. It is most regrettable that the name of such a company should be incorrectly printed in a paper like *The Iron Age*, which should, presumably, be well informed regarding manufacturers of such long standing.

## Lake Superior Mining Curtailment

MARQUETTE, MICH., June 17, 1911.—The curtailment of operations at the mines of Oglebay, Norton & Co., which previously had affected two properties on the Menominee range, has extended to the Wisconsin portion of the Gogebic district. The Ottawa property west of Hurley has been closed. In the neighborhood of 175 men have been made idle. The mine has a stockpile of 50,000 tons, and until this ore has been sold and moved it is not expected that operations will be resumed. The pumps in the bottom of the mine have been taken out and the workings will be permitted to fill with water as far as the eighth level.

Additional retrenchments have been made on the Marquette range. The Rogers-Brown Iron Company's Portland mine in the Michigamme district has discontinued both mining and stripping operations, and will not resume until the iron trade experiences material improvement. The Portland is an open-cut property, active only in summer. It produces a limonite ore of low grade, lean in iron and high in phosphorus, for which in times such as these there is little or no demand.

The Republic Iron & Steel Company has materially scaled down operations in the Negaunee district of the Marquette range. It has a group of three properties in this field—the Cambria, Lily and Hartford—all on the south side of Teal Lake. The Cambria has been closed, affecting 125 men. The Lily is employing only 50 men, and the Hartford about the same number. It was at the Hartford that the disastrous fire costing seven lives recently took place, and the only work now in progress there is that of repairing the damaged shaft. No mining has been done since the fire, and none is likely until the business outlook brightens.

Corrigan, McKinney & Co. have closed the Baker mine at Stambaugh, Menominee range, and will permit the workings to fill with water. Eighty men were on the payroll. Most of the ore hoisted latterly has come from the adjoining Tully tract. This latter property is now being developed, however, shaft sinking being in progress, and it probably will handle its own production in the future. The Baker will be out of commission until the iron market improves.

Another mine that has been added to the idle list is the Florence property, at Florence, Menominee range, operated by Ladenberg, Thalmann & Co., New York. It has 70,000 tons of ore in stock, none of which has been sold. The mine was employing 160 men. Some of these have been transferred to the company's large farm near the village, where considerable improvement work will be carried out; others have been sent to the Bates property, in the Iron River district, where a new mine is being opened, and still others have been added to the forces employed in exploratory operations in the vicinity of Florence. The greater number of men have, however, been thrown out of work. The pumps are retained in commission, keeping the workings free of water, and there will be no delay, once operations are ordered to be resumed.

At the Cambria Steel Company's Penn group of mines in the Norway-Vulcan district of the Menominee range, where the working force recently was reduced to the extent of 150 men, the employees retained on the payroll are on duty only four days each week. Underground operations at the Norway mine have been suspended entirely.

The curtailment of mining work is, of course, affecting railroad traffic in the Lake Superior region. Only one railroad, the Great Northern, is particularly busy, and this is because of the Hill contract with the United States Steel Corporation. The traffic has fallen off especially on those lines serving the Marquette, Menominee and Gogebic ranges. As a result fewer train crews are employed than in any season for a number of years. Conductors and engineers have been demoted to the brakes and the fire-box, respectively; section men, firemen and brakemen have been laid off, and only such repair work is being done as is absolutely necessary. On the Lake Superior division of the Chicago, Milwaukee & St. Paul Railroad, to quote one case in point, upward of 100 employees have been thrown out of work the past fortnight. At Channing the junction where the ore trains are transferred to the tracks of the Escanaba & Lake Superior Railroad for conveyance to the shipping port at North Escanaba, the dispatcher's office has been closed.

## Thermit

### Can Be Produced in Almost Infinite Variety

BY WILLIAM R. HULBERT.\*

Probably the majority of the readers of *The Iron Age* are familiar with the thermit process of welding, but it is doubtful if many of them are aware that there are a great many different kinds of thermit in general use. The composition generally called thermit is a mixture of aluminum and iron oxide, and on reaction gives superheated liquid steel. While this is undoubtedly the best known thermit, there is an almost infinite variety of others. Some are extremely valuable commercially and scientifically, while others are not so important.

A good definition of a thermit would be the following: A thermit is a mechanical mixture of a metallic oxide, sulphide or chloride with finely divided aluminum in such proportions that the aluminum on reaction will entirely reduce the metallic element from the oxide. It will readily be seen that a great many thermit compounds are made possible under this definition, but the rule does not apply to all oxides, sulphides and chlorides, as in some cases the metallic element to be reduced has an affinity for oxygen quite as high as the aluminum, in which case, of course, no thermit reaction can be made to take place.

#### The Foundation of the Thermit Reaction

The foundation of the thermit reaction is the attraction of aluminum for oxygen. If this attraction is very much greater than the attraction of some other element for oxygen, then the thermit reaction is a very rapid one and a great deal of heat is set free. If, on the other hand, the attraction of the aluminum for the oxygen is not so great in proportion as that of the other metallic element, then a reaction will still take place, but it will be very much slower and in some cases so slow that it is kept going only with difficulty. In this case very little heat is evolved.

An example of such a reaction can be had in the case of ordinary iron thermit, consisting of iron oxide and aluminum, which burns very fast. Half a minute is usually sufficient for almost any quantity of thermit to be brought into reaction. On this account the temperature of the resulting mixture is extremely high, being estimated at 5400 deg. F.

If, now, we use ferrotitanium thermit, we find that a reaction is extremely slow, so that the resulting metal hardly remains in the liquid state any time at all; the heat evolved is, therefore, very slight.

If a mixture of pure titanium oxide and aluminum be used, no reaction can be had at all, for the simple reason that the titanium has an affinity for oxygen almost as high as aluminum. The only way that a reaction can be made to take place is to mix the titanium oxide with iron oxide and aluminum, in which case the heat evolved by the reaction between the iron oxide and aluminum helps to melt up the titanium, so that eventually the entire mass is brought into reaction at once. In this way ferrotitanium is produced instead of pure titanium, and for ordinary commercial purposes ferrotitanium is considerably more desirable than the pure, so that this limitation of the thermit reaction is really beneficial.

Among the various thermit compounds which are used commercially might be mentioned the following: Iron thermit (the well-known welding compound), nickel thermit, manganese thermit, chromium thermit, ferrotitanium thermit, ferrovanadium thermit, ferro-boron thermit, ferro-molybdenum thermit, as well as thermit used in connection with the production of special alloys between any of the above mentioned metals, such as manganese-tin, manganese-zinc, chromium-molybdenum, manganese-titanium, chromium-copper, molybdenum-nickel, etc.

#### Ferrotitanium the Most Important Alloy

Of all of the metals and alloys produced by these thermit compounds probably the most important at the present time is ferrotitanium. This alloy is a light grayish metal, is hard and brittle in character, and contains from 20 to 25 per cent. titanium, 3 to 5 per cent. aluminum and the

rest iron. The other impurities are so small in proportion as to be negligible. The aluminum should not be regarded as an impurity as it helps the solubility of the alloy materially when added to steel or iron. Of course, being produced by the thermit reaction, the alloy is absolutely free from carbon, which is a very great advantage, as wherever carbon is present it combines with the titanium to form titanium carbide, which dissolves with great difficulty in iron or steel, and considerable of the titanium is, therefore, wasted. It can easily be shown that where a ferrotitanium alloy contains as much as from 5 to 8 per cent. carbon at least 15 to 20 per cent. of the titanium content is wasted in the form of titanium carbide. In the case of an alloy produced by the thermit reaction all this waste is entirely eliminated, while an additional advantage is gained through the higher specific gravity of the thermit product over that produced in the electric furnace or by other methods. This higher specific gravity is of considerable importance, as it permits of the alloy sinking into the iron or steel treated and avoids any danger of its floating on top and being wasted in the slag.

Ferrotitanium at the present time is one of the most generally used purifying agents for iron and steel in the metallurgical field. Its beneficial effect is due primarily to its deoxidizing action and to the fact that it has the property of combining with any nitrogen that may be present in the molten steel or iron. Titanium destroys the very harmful iron oxide, forming titanium oxide, and absorbs the nitrogen, forming cyanonitride and nitride of titanium, which pass into the slag. Titanium also acts to a considerable extent on the sulphur and phosphorus, forming titanium sulphide and phosphate of titanium, respectively.

In practice, only a very small amount of ferrotitanium need be used, and for ordinary purifying purposes an addition of from 0.05 to 0.2 per cent. of titanium content, or 2½ to 10 lb. of the alloy (20 to 25 per cent. titanium), per 1000 lb. of metal is sufficient. In iron and steel foundry practice an addition of from 2 to 3 lb. of alloy per 1000 lb. of metal is, in most cases, all that is needed. In making special steel products which have to withstand high physical tests, such as rails, high-grade castings and special steels, somewhat more of the ferrotitanium is required.

#### Chromium and Vanadium Next Most Important

Next to ferrotitanium probably the most important metals are chromium and vanadium. Chromium is produced in the pure state 97 to 98 per cent. and free from carbon. Vanadium, however, is produced as ferro-vanadium with a vanadium content running from 30 to 35 per cent.

The beneficial effect of these metals for alloying purposes is now so generally recognized and so well known that it is not necessary to touch on them here. But the thermit metals and alloys possess the advantage over the other metals to be obtained on the market that they are free from carbon, and it is, therefore, possible to add as much or as little of them to the iron or steel bath as may be desired without danger of increasing the carbon content thereof. Another advantage, however, is the fact that being free from carbon they dissolve more readily than alloys which contain carbon.

One of the most interesting applications of the thermit reaction is the addition of ferrotitanium thermit to cast iron. In this case the ferrotitanium is actually produced under the surface of the iron treated, and is, therefore, set free in the nascent state. In practice, the ferrotitanium thermit is put up in sheet iron cans, with which is also packed a small amount of ignition powder. These cans when used are attached to a wrought iron or steel rod about ¾ in. in diameter and plunged into the ladle containing the molten steel or iron which it is desired to treat. The heat of the molten metal ignites the ignition powder, which in turn starts the ferrotitanium thermit reaction. A seething motion will be seen in the ladle, and the iron or steel treated will undergo a considerable increase in temperature. In the case of cast iron it will show a white heat, almost as of steel.

At the end of the operation it will be noticed that the fluidity of the treated metal has been increased to a marked degree, while the castings poured will be of denser grain and greater strength. The process is exceedingly

\*Manager of Sales, Goldschmidt Thermit Company, 90 West Street, New York.



valuable where it is desired to pour thin or intricate castings, or for castings which are required to show a smooth finish and fine grain, particularly hydraulic fittings, cylinders for engines, air compressors, etc., and for any other work where a high-grade casting is required.

To those interested in metallurgy it will be seen that the various thermit mentioned above are quite as important in their way as the welding thermit, or iron thermit, with which the general public is most familiar.

## The Ohio Workmen's Compensation Law

The Green workmen's compensation bill has been passed by the Ohio Legislature, was signed by Governor Harmon June 16 and is now a law. It will go into effect January 1, 1912. This law is regarded as one of the most advanced compensation acts that has been adopted in this country. Soon after the opening of the last session of the Ohio Legislature two compensation bills were introduced, one of which was indorsed by employers and the other was favored by organized labor. Various amendments were made and the law as enacted represents a compromise between the two bills.

The Ohio compensation law applies to employers of five or more men, but leaves it optional with the employer whether he shall make payment to the compensation fund and come under the general provisions of the act. The act provides for the appointment of a state liability board of awards, which shall make payments for injury and death. This board is to consist of three members, appointed by the governor. The members are allowed an annual salary of \$5,000 each and are to devote their entire time to the work of the board. Provision is also made for inspectors, examiners and other assistants that will make a complete organization.

The law provides that the board of awards shall classify employments with respect to their degree of hazard, and determine the risks of the different classes and fix the premium for each class, making it sufficiently large to provide an adequate state insurance fund for the compensation provided for and to create such surplus as is needed. Ninety per cent of the premiums for the insurance fund are to be paid by the employer and 10 per cent by his workmen, the employers being authorized to deduct the 10 per cent from the pay roll of their employees.

An employer who comes under the operation of the law by paying the assessments into the state insurance fund and who posts notices conspicuously about his place of business that he is paying premiums into this fund shall not be liable for damages for injury or death of his workmen under the common law or statutes. An exception, however, is made in case injury or death has been caused by the willful act of the employer or an agent, or from the failure of the employer or his agents to comply with municipal ordinances or state laws for the protection of the life or safety of employees. Then nothing in the compensation law shall affect the civil liability of such employer, but the employee may at his option claim compensation under the law or institute suit in the court for damages. If the employee asks for an award from the board he cannot later, if dissatisfied with the award, bring suit for damages unless the board has refused to award him anything. In that case he can bring suit in the civil courts in the regular way, first filing an appeal from the finding of the board within 30 days and then a petition within the next 30 days, making the board the defendant. If a judgment for damages is allowed by court or jury it shall be paid by the board out of the state insurance fund. An employer who does not elect to pay the premiums provided into the state insurance fund shall be liable to his employees for damages suffered from personal injuries caused by the wrongful act, neglect or default of an employer or his agent, and if sued for damages is not allowed to avail himself of the common law defenses of fellow servant, assumed risk or contributory negligence.

The schedule of awards is as follows:

For partial or temporary disability, two-thirds of the impairment of the workman's earning capacity during the continuance thereof, not less than \$5 or more than \$12 per week, and not to continue for over six years or to exceed \$3,400. If the employee's wages were less than \$5 a week he is to receive his full wages.

For permanent total disability, two-thirds of the average weekly wages, but not more than \$12 or less than \$5 per week, to continue until death. Full wages shall be paid if the employee's wages were less than \$5 per week.

The board shall pay in addition to the award not to exceed \$200 for medical services.

In case injury causes death within two years, payments are to be made as follows: If there are no dependents the disbursements are to be limited to medical services and a maximum of \$150 for funeral expenses. If there are wholly dependent persons at the time of the death the payment shall be two-thirds of the average weekly wages, which shall continue from the date of the death to six years after the date of the injury, but not to exceed \$3,400 or be less than \$1,500. If there are partially dependent persons the payment shall be two-thirds of the average wages and shall continue for all or such portions of six years after date of injury as the board may determine, but not to exceed \$3,400. When there is more than one dependent the board is to determine how the fund is to be divided. If the injured employee was of such age and experience when injured that under natural conditions his wages would be expected to increase that fact may be considered in arriving at his average weekly wage. The entire expense of the administration of the fund is to be borne by the state.

## Safety Devices for Iron Mine Workmen

To make its mining operations in the Lake Superior region as safe as possible for the employees, the United States Steel Corporation is spending much money. Committees composed of experts in the various departments are inspecting both the surface and underground equipment, and as fast as recommendations are made they are approved and ordered to be carried into effect. The work is well advanced, but it will be a number of months before it is completed. In the Marquette district the inspection already has resulted in the installation of a large number of safety devices.

What is being done on the Marquette range is typical of that being accomplished in the Lake Superior country generally. All machinery is being thoroughly guarded, all gearing and belts being covered with locked devices. In buildings where overhead shafting and similar equipment are in operation platforms for the accommodation of the men have been provided, and all of these are equipped with iron railings. In the big machine shop at the Lake Superior hard ore mine, for example, the engines and the gearing and belts which extend to the floor are inclosed in cages made of one-inch mesh wire cloth, with heavy steel bracing. There is not an exposed gear anywhere. On engines where oil cups cannot be reached from the floor, stairways are constructed leading to the crank blocks. These are provided with railings.

Some of the safety devices are unique. A man can now operate the circular saw without any possible danger of injury. When the board is being cut the entire saw is out of sight, being covered in such a way that the operator cannot get his hands against the teeth. To change the belting on any of the shafting it is necessary to open the doors of the safety devices. All of these are provided with catches, and the workmen are instructed not to leave the doors open when the machinery is in operation. The inspection by the surface safety committee includes the shafthouses and all places above ground where machinery is employed, even to the steam shovels.

The belting, gearing and shafts of the steam shovels are protected in a manner similar to those in the engine houses and shops. In fact, men employed about machinery of any kind are being made as immune from accident as is possible. Underground work will be made equally as safe. The Cleveland Cliffs Iron Company has adopted a similar policy, and it is likely that most of the other more important operators in the region will follow suit.

Frederick E. Fieger, House Building, Pittsburgh, consulting and designing engineer for general mill work, advises that the additions to the plant of the Portsmouth Steel Company, Portsmouth, Ohio, for which he prepared plans, are progressing satisfactorily and that they will be ready for operation within the time specified.

## The Machinery Markets

The event of the week was the placing of large orders by the American Steel & Wire Company against a large list sent out several weeks ago. A great deal of the business given out so far has gone to Cleveland machinery houses, although orders have also been placed in New York, Boston and Chicago. The machinery demand is better in Cleveland and the automobile builders have re-entered the market there with some machinery orders. Some good electric power plant business has also developed in Cleveland. The International Harvester Company continues a heavy purchaser in Chicago and has closed out on a \$15,000 list of tools. An automobile maker has bought about \$12,000 worth of mechanical equipment and the Government has placed orders for tools for the Rock Island Arsenal. The automobile factories in Detroit are busy and are customers in that market. Inquiries have increased in Cincinnati and the railroads are becoming more active purchasers. There are more inquiries out in St. Louis than there have been in some time and a good general business is being done. In the East business is not quite so good. Conditions are quiet in New York, but in Philadelphia there are better inquiries, although trade is spotty. The situation remains rather unsatisfactory on the Pacific coast. In Texas the demand for cotton ginning machinery is unusually heavy and is on the increase.

### New York

NEW YORK, June 21, 1911.

The New York Central Railroad is making new inquiries for equipment in addition to that on which it has been getting bids of late. During the week the company urged a number of machinery sellers to get in their bids as soon as possible, which is an indication that the business will be closed out very shortly. Information has been given that another list will appear in the near future. Inquiries from the other railroads are not so plentiful, although some good sales were made to railroad men during the week at the Railway Convention at Atlantic City. Many prominent machinery men have been in Atlantic City since the convention opened and most of them have done a good business. The machinery demand from the general manufacturing field is light and no sales of consequence were made during the week except for export. The demand for machine tools from Europe is exceptionally good and some good shipments of power machinery have been made to Cuba and the British West Indies. The latter consisted principally of Corliss engines and boilers for delivery to sugar plantations.

Machinery men would do well to watch the future movements of the Pennsylvania General Electric Company, as it is understood that plans for enlarging its plant at Erie, Pa., are going forward rapidly. The company is looking into the matter of locating its gasoline motor department at Erie as a part of its plan to establish extensive works there.

Those in charge of the plans of the Delaware & Hudson Railroad for constructing large shops at Watervliet, N. Y., declare it will be several months before machinery for the proposed shops there will be purchased. Recent inquiries sent out by the company were for equipment intended for other shops and not for the Watervliet shops as many in the trade supposed.

The Willsea Works, Rochester, N. Y., has been incorporated with \$30,000 capital stock to take over and continue the foundry and machine business of J. Emory Jones, which has been conducted since his death by his heirs. The company will do a general business, making wood and metal patterns, machine castings and small machine work, forging, etc. The incorporators include L. P. Willsea, F. W. Willsea and E. J. Willsea, all of Rochester.

The Bennett Mfg. Company, manufacturers of portable electric lamps, 409 Broadway, New York, contemplates the erection of a large addition to its plant at East Syracuse, N. Y.

The Marine Shop of the New York Central Railroad, at West New York, N. J., was badly damaged by fire June 18. The loss is to the wood working and machine shop departments of the works.

Johnson & Murray, Utica, N. Y., have completed plans for a factory and warehouse building, 80x290 ft., four-story and basement, reinforced concrete construction, which they will erect at once at Seneca and Whiteboro streets, at an estimated cost of \$125,000.

The Commissioner of Education, Dr. Andrew S. Draper, State Normal College, Albany, is receiving bids for the electrical equipment of the State Normal School at Oneonta, N. Y., including direct connected engines and dynamos, switchboard, feeder cables, and interior wiring for electric lighting.

The Nokik Crank Sales Company has been incorporated at Waterloo, N. Y., with a capital stock of \$50,000, to manufacture safety cranks for automobile

engines. J. Harker, J. L. Dougherty and C. E. Ramises of New York City are the incorporators.

The Mohawk Silk Fabric Company, Fultonville, N. Y., manufacturer of ladies' silk gloves, hosiery and underwear, has completed plans for a silk mill 50x300 ft., two stories, of brick construction, which it will build at Kingston, N. Y. The machinery equipment will consist partly of new equipment and partly of a portion of machinery to be moved from Fultonville. The Fultonville plant will be maintained and operated as an auxiliary.

The East Creek Light & Power Company will build and equip a \$50,000 power house, 60x90 ft., four stories, at Ingrams, N. Y. The contract for construction of the building has been let to Brown & Lowe, general contractors, Schenectady, N. Y.

The Charles B. Knox Gelatine Company, Johnstown, N. Y., has let contract for the construction of a three story and basement factory building, 62x128 ft., and a power house 40x50 ft., to cost about \$60,000.

The Lyrachord Company, Yonkers, N. Y., has been incorporated with a capital stock of \$150,000, to manufacture electric pianos. J. T. Gibson, 232 Washington avenue, is managing director.

The Commissioner of Public Works, F. G. Ward, Buffalo, N. Y., has awarded contract for five 30,000,000 gal. pumping engines for the new waterworks pumping station, foot of Porter avenue, that city, to the Holly Mfg. Company, Roberts avenue and Pennsylvania Railroad, Buffalo. The amount of the contract is about \$700,000.

The Babcock Electric Carriage Company, Buffalo, is building a one story brick addition to its plant on West Utica street.

Plans and estimates for the sewage disposal plant to be constructed by the city of Rome, N. Y., have been completed by Engineer Rudolph Hering, of New York City. The total estimated expense is \$127,000, including pumping station with pumps, pump well and screens, preliminary settling tank, sprinkling filter and dosing tank, final settling tank, sludge bed, piping, etc.

The Hutchins-Kilbourne Company has been incorporated at Buffalo, following a merger of the Hutchins Mfg. Company, Buffalo, and the Kilbourne Mfg. Company, Troy. The new company has purchased the plant of the Eureka Steel Novelty Company on Schenck street, Tonawanda, which it will enlarge and equip for use of the wood working departments of the company. The operation of the present plant of the former Hutchins Mfg. Company, on Prospect avenue, Buffalo, will also be continued.

Baker & Co., Inc., refiners, assayers and smelters, Newark, N. J., contemplate enlarging their plant in the near future, although no definite plans have as yet been made. They report business and prospects good.

S. Cheney & Son, gray iron founders and manufacturers of hardware specialties, Manlius, N. Y., expect to substitute electric power in their plant in place of steam, before the year is out. They have recently added a new store house.

The Clark Novelty Company, Rochester, N. Y., manufacturer of special machinery, tools, punches, dies, etc., is installing some new automatic screw machines to take care of that branch of its increasing business.

The Jonathan Bartley Crucible Company, Trenton, N. J., contemplates the installation of some new machinery. Its plant is running to full capacity.

The States Company, 202 West Water Street,



## THE MACHINERY MARKETS

Syracuse, N. Y., has been organized to manufacture a line of electrical instruments and appliances. The company has an authorized capital stock of \$50,000, and the incorporators are Roger H. and H. A. Blakeslee, Hartford, Conn., and Henry J. Blakeslee, of Syracuse, N. Y.

Joseph Bardsley, 147-151 Baxter street, New York, manufacturer of door checks and springs, spring hinges, etc., is preparing to increase the manufacturing facilities of his plant and will shortly add to his line of manufacture.

The newspaper report to the effect that the White Sewing Machine Company, the New Home Sewing Machine Company and the Standard Sewing Machine Company are to be merged into one corporation has been denied by officials of all the companies mentioned.

### New England

BOSTON, June 20, 1911.

A general sentiment prevails that business conditions are about to improve materially. Some manufacturers of machine tools have already felt the change in the form of increased orders, but as a general thing no substantial evidence of a reaction towards better business has become apparent. Local industrial stocks are stronger. They have held up very well in practically every case during the depression and quotations average fully as high as they did at the height of prosperity three years ago. The general opinion is that the vacation season will prevent any immediate radical improvement, but that the cold weather will bring with it the long looked for resumption of active demand all along the line in the metal industries. The actual sales made by the dealers have not shown any important increase to date.

The New London Ship & Engine Company, Groton, Conn., plans to build a large extension to its machine shop this summer. This company is affiliated with the Electric Boat Company and the Fore River Ship Building Company, and manufactures the engines and the machinery of the submarines in which the Electric Company specializes. The company states that there is no truth to the report that the New Jersey plant will be removed to Groton, neither will its force of workmen be reduced to augment that at Groton. The latter works have been in operation only a short time.

The International Machine & Screw Company, Springfield, Mass., has developed a line of wood screw machinery and proposes to put its product on the market in connection with its line of machine screws. George T. Warwick, vice-president and general manager, has applied a novel principle in this equipment which has been alluded to in connection with the machine screw machines. The company is not yet manufacturing on a commercial basis.

The H. H. Sprague Company, Bridgeport, Conn., manufacturer of gas meters, will build an addition to its factory, 65x152 ft., two stories and basement, and saw-tooth roof.

Butterfield & Co., Derby Line, Vt., manufacturers of stocks and dies, die plates and screw plates, etc., plan to increase their works and will add 50 to 75 hp. to the power plant. A small quantity of woodworking machinery will be required.

The Birmingham Iron Foundry, Derby, Conn., is making important alterations to its factory buildings. The improvements are in the nature of building over rather than additions, but manufacturing facilities will be largely increased when the changes are completed. The company will have a new office building, 35x52 ft., to accommodate the executive offices, drafting room and clerical departments.

The Bristol Company, Waterbury, Conn., manufacturer of recording instruments and steel belt lacing, is erecting a two-story fireproof building which will be occupied by the dipping department and for the storage of oils.

The American Wringer Company, Woonsocket, R. I., is increasing its works by buildings 40x50 ft. and 40x60 ft., both one story. They will be devoted to the manufacture of mechanical rubber goods.

The business of the Revere Drop Forge Company, Revere, Mass., has been incorporated under the same name with a capital stock of \$25,000. Charles Robertson is the president, Charles Robertson, Jr., vice-president; Thomas V. Sargent, treasurer, and Horace S. Sargent, clerk. The business was conducted as a co-partnership between Charles Robertson and Thomas V. Sargent. Each has taken a son into the business. The company manufactures drop forgings of all descriptions.

The Machine Nut & Bolt Company, Bridgeport, Conn., has been incorporated under a Connecticut charter to manufacture lock nuts, bolts and washers, a patented lock nut being the specialty. Newton F. Chamberlin is the president, and Frank C. Johnson, secretary and treasurer. The company is doing preliminary work at present, and will establish a factory as soon as the equipment can be made ready.

A new factory of the Artistic Bronze Company, South Norwalk, Conn., will be located at Bridgeport, Conn., and will be 65x175 ft., one story.

The New York, New Haven & Hartford Railroad has begun the erection of a group of buildings at New Haven, Conn., which will include a machine shop for locomotive repairs and a power plant.

### Philadelphia

PHILADELPHIA, Pa., June 21, 1911.

Current business has not been characterized by any large lot buying and will, therefore, hardly measure up in volume with that of the previous week. About the same proportion of small business, however, continues to be noted. In instances inquiries are reported to have been a trifle more numerous and also have a more substantial appearance, particularly in connection with some classes of special tools, several makers of which have recently reported better conditions. As a general rule, however, manufacturers of the usual types of machine tools report practically unchanged conditions. Buying is listless and plants continue to be operated on an irregular basis. Encouragement is taken in the reported better prospects for business, as a whole, particularly in the West, but so far the trade in this territory has not experienced any pronounced betterment. Considerable attention is being given the conventions of the Master Mechanics and Master Car Builders, held at Atlantic City, by both the merchants and manufacturers in this district, a number making exhibits of their equipment. The demand for machine tools coming from the railroads in this vicinity continues very light. In second-hand machinery little improvement in the demand is reported, while that for iron and steel castings continues very spotty. Boiler and tank makers report, in some cases, a very fair run of business, but the demand for engines for power purposes still has a tendency to drag.

The Pennsylvania Railroad has sent out an inquiry for a moderate sized drill press.

The General Chemical Company, which purchased, some time ago, an extensive tract of land at Marcus Hook, below Chester, Pa., states that plans have been completed for the erection of buildings to comprise a new plant. It has not been fully decided, however, whether the construction work will go ahead during the present summer or be deferred until next year.

It is reported that the Empire Grate Company, Chester, Pa., will remove its foundry and machine plant from the present location, Ninth and Hyatt streets, to a new site, said to be located at the foot of Jeffry street, in the same city. Details regarding the proposed new plant are not available.

The Energy Elevator Company reports a most satisfactory demand for its various types of elevators. The plant has been operated at full and over time capacity, in order to keep up with required deliveries. Local business has been particularly good and the out of the city demand above the average. Several deliveries of heavy electric power freight elevators, including one for the Press Building of Princeton University, Princeton, N. J., and another of the same type for a canning factory in Morganville, N. J., are reported. A large hand power freight elevator has just been shipped to the Honolulu Islands.

The Philadelphia Construction Company has the contract for the erection of the buildings to be constructed for the Organic Chemical Mfg. Company, at Fort Washington, Pa. The buildings are to be of reinforced concrete and include, it is said, one two-story building, 40x120 ft. and one one-story building, 22x32 ft.

James H. Knoll, Reading, Pa., manufacturer of washing machines, is erecting a three-story factory building, 91x50 ft., of concrete construction, at 124 to 134 Maple street, in that city. An automatic sprinkler system will be installed. Information regarding additional equipment required for the new plant is not available. The present plant is located at Tenth and Chestnut streets, in the same city.

A considerable amount of general work is to be done at the Homeopathic State Hospital for the Insane, Lehigh County, Pa., for which bids will be re-

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ceived at the institution, near Allentown, Pa., on July 1. Plans and specifications may be obtained on application to the architect, Philip H. Johnson, Land Title Building, Philadelphia, Pa., on payment of \$25.

H. B. Underwood & Co., Inc., report business in general as fairly active, but the demand for special tools has a tendency to drag.

The director of supplies, city of Philadelphia, 310 and 312 City Hall, has made a preliminary announcement regarding bids for supplies for various city departments, for the year 1912, proposals for which will be opened on various dates beginning August 1 and following on August 15, September 1 and 15 and October 2 and 16. Blank proposals, specifications and samples will be available about ten days before each date. Among the various articles for which bids will be received are the following: Class D—Tapping machines and fittings, calking machines, lead melting furnaces, removable plugs, chain hoists, chain belts, sprocket wheels, furnace rings, pipe jointers and cutters.

The shop facilities of the Blystone Mfg. Company, Cambridge Springs, Pa., are to be increased by the erection of a building 80 x 100 ft. The company manufactures concrete mixers and core sand mixers, and recently it has found business better in the Far West than in the territory adjacent to its plant.

The Ball Engine Company, Erie, Pa., has found its inquiries to have increased during the last month and is looking forward to a betterment.

### Detroit

DETROIT, MICH., June 19, 1911.

The past week has seen a resumption of activity in trade in almost all lines. The automobile factories are generally adding new men to their pay rolls, and several are planning additions to their plants. The ship building companies and railway equipment companies are also reported to be extremely busy, the Pennsylvania Railroad having placed good sized orders with two local car companies. The market for small tools and second-hand machinery is rather dull just at present, although there have been small purchases of the latter. The smaller industrial centers throughout the State are also enjoying improved conditions, and automobile factories in Jackson and Flint are working full time with a full enrollment of workers. Some of the furniture factories in Grand Rapids are resuming operations, and this will have a tendency to stimulate trade in that section of the state.

Benjamin Briscoe, president of the United States Motor Company, has announced that the Alden Sampson Mfg. Company, one of the subsidiary companies in the United States Motor group, will start work in a few days on a large addition to its present plant. The new building will be used for the manufacturing of delivery cars and will give employment to several hundred men.

Plans are being prepared for several additions to the plant of the Ford Motor Company in Highland Park. The principal building will be 865 x 74 ft., and the cost of construction and equipment will represent an investment of \$500,000. In connection with these extensions, Secretary James Couzens states that it is very probable that the Ford pressed steel works will be removed from Buffalo to Detroit.

The E. M. F. Company has awarded the contract for a three-story brick factory building as an addition to its present plant to R. R. Habercorn.

Detroit is to be the home of two new automobile factories, plans for the organization of which were perfected this week. Both companies will manufacture cars of the light delivery type. The concerns are the Wagenthals Motor Car Company, with a capital stock of \$100,000, of which W. G. Wagenthals will be president and general manager, and the Coleridge Commercial Car Company, with a capital stock of \$50,000. W. J. Underhill will be secretary and J. G. Coleridge general manager.

The Peter Smith Heater Company of this city has purchased the plant formerly occupied by the Federal Motor Truck Company in Ypsilanti. By this move the company, which manufactures street car heaters, will triple its capacity.

The Mulkey Salt Company has been organized with a capital stock of \$25,000 and will take over the evaporating plant of the bankrupt Detroit Salt Company. J. M. Mulkey is president and J. A. DeTar general manager of the new concern.

The Detroit Utensil Company has been incorporated with a capital stock of \$6000. The company will manufacture a patent milk bottle cabinet.

A new automobile accessory company is being organized here to be known as the Detroit Demountable Rim Company. The concern will have a capital stock of \$50,000 with Harry M. Smythe and Chester C. Hailbridge as the principal stockholders.

The Modern Laundry Company has been incorporated with a capital stock of \$20,000. Frederick W. Brede will be the active head of the new company.

The Cleveland Cliffs Iron Company will, it is reported, soon award contracts for the construction of a new boiler plant, crush house and dry house at its Negaunee mine.

The large cooperage plant of the R. G. Peters Salt & Lumber Company at East Lake, Mich., was totally destroyed by fire last week, involving a loss of \$20,000. The plant will probably be rebuilt.

The New Haven Elevator Company has been organized with a capital stock of \$30,000. A large beanery and elevator will be erected at New Haven, Mich., with branches at Fair Haven and New Baltimore. J. A. Heath will be general manager of the new company.

The village of Comstock, Mich., is in the market for an up-to-date fire engine and other fire apparatus. J. H. McCormick is at the head of the purchasing committee.

The Monroe Gas Light & Fuel Company, Monroe, Mich., is erecting an addition to its plant that will double its capacity. The new building will be 40 x 30 ft. A 40 hp. boiler and two benches of six retorts each will be installed.

The Caro Light & Power Company, Caro, Mich., has been sold to T. W. Atwood. The purchaser will install new equipment at the generating station and may add a new motor pump at the water works. A power circuit will also be established if it is decided that the demand warrants.

It is reported that the buildings of the Corwin Lumber Company and the planing mill of the Henry J. Adams Co., which were destroyed by fire recently, will be replaced.

The Munising Woodenware Company has been organized with a capital stock of \$50,000. The company has secured the business and patents of the Kalkaska Mfg. Company and will manufacture on an extensive scale.

The Cleveland Cliffs Iron Company is preparing to install safety devices in its various mines on the Marquette, Gogebic and Mesaba iron ranges. W. G. Mather, Cleveland, Ohio, president of the company, has the matter in charge.

The large saw mill of Crawford & Son at Cedar River, Mich., was completely destroyed by fire last week, entailing a loss of \$100,000. The plant was partly covered by insurance, and it is understood that steps will be at once taken to rebuild. Two band saws, a gang saw, edges, trimmer and lath mill are among the equipment which will have to be replaced.

Battle Creek, Mich., is to have another new industry, to be known as the Sorority Gum Company, the capital stock of which, it is stated, will be in the neighborhood of \$100,000. W. F. and D. M. Taylor of Battle Creek will be extensively interested in the new concern.

The Simplex Fence Machine Company, with headquarters in Battle Creek, will shortly establish a factory in Holland, Mich., for the manufacture of woven wire fence and wire concrete reinforcement.

The Menominee Electrical Works has made arrangements to establish a new department for the manufacture of an electrical ventilating apparatus.

The E. C. Slocum Mfg. Company, Fenton, Mich., has purchased the rights for the manufacture of the I. X. L. seeder from M. V. Kinne and will at once replace a large portion of the machinery now in use to handle the increased output.

The Buckeye Iron Company, Marquette, Mich., has increased its capital stock from \$500,000 to \$625,000.

Chelsea, Mich., has secured an important new industry in the Michigan Portland Cement Company. The new concern has a capital stock of \$500,000.

The Grayling Wood Products Company, Grayling, Mich., has been incorporated with a capital stock of \$25,000 and will engage in the manufacture of turpentine, wood alcohol and similar products.

The Michigan Sugar Company is erecting an addition 64 x 68 ft., three stories, at its Carrollton plant and will equip it with the most modern machinery for the reduction of molasses.

The Grand Rapids Pearl Button Company has filed



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articles of incorporation and leased quarters and will begin operations as soon as the necessary equipment can be installed. The company has a capital stock of \$100,000.

The Elliott Machine Company, Grand Rapids, Mich., is having plans drawn for a new plant to cost in the neighborhood of \$100,000. The building will be three stories 60 x 450 ft. The company manufactures shoe button fastening machines and other machinery specialties.

With \$50,000 capital stock another industry is about to be launched in Grand Rapids, Mich., to be known as the Van-L Commercial Car Company. The company will manufacture a device for use in the automobile truck business. George Van Antwerp and John W. Landman, both of Grand Rapids, are the men behind the new enterprise.

The Victor Brown Company has been organized in Grand Rapids, Mich., to manufacture a patent broom invented by V. E. Clark, who has a large interest in the company.

The Holland Wire Fence Company is considering plans for the building of a new plant at Holland, Mich., 40 x 132 ft. This company was formerly located at Battle Creek, Mich.

The Michigan Steel Castings Company, Detroit, Mich., is about to build a one-story steel foundry, the building to cost in the neighborhood of \$5000.

The American Blower Company, Detroit, Mich., has recently purchased property adjacent to its No. 1 plant on which it will rebuild a large warehouse. Minor additions and improvements are being planned for its other shops. The company reports a better volume of business and is running its plants practically full capacity.

### Cincinnati

CINCINNATI OHIO, June 20, 1911.

The excellent crop reports now coming in have undoubtedly stimulated general business to some extent, and there is an increase in the number of inquiries for machine tools. There is also reported some single tool railroad buying, but the total amount of business received from this quarter continues disappointing.

Second-hand machinery dealers are doing a fair business and state that the outlook is better than it has been for some time. The hardware and mill supply houses are busy, and those handling building supplies are enjoying an especially good period of activity.

The Cincinnati Aeroplane Company is a new Cincinnati incorporation, with \$20,000 capital stock. It is the intention of the company to manufacture a bi-plane invented by Louis Mueller, of College Hill, Ohio. R. K. Hynicka, of Cincinnati, is one of the leading promoters of the new company.

The Buckeye Iron & Brass Works, Dayton, Ohio, is erecting an addition to its plant. The new structure will be 80 x 160 ft. and will be used as an iron foundry.

The McClintock-Marshall Company has contract for constructing several large buildings that will be added to the plant of the Ford Plate Glass Company at Rossford, Ohio.

The Olive Foundry & Machine Company, of Ironton, Ohio, has changed its name to the Ironton Punch & Shear Company.

The Building Committee of the Ohio Mechanics' Institute, Cincinnati, has awarded through Samuel Hannaford & Sons architects, the following contracts for power plant equipment: For boilers to the Babcock & Wilcox Company; two engines to the Buckeye Engine Company and one to the Skinner Engine Company; mechanical stokers, the Murphy Iron Works Company; generators to the Triumph Electric Company, and hot water heaters and purifiers to the Harrison Safety Boiler Works Company.

The Edwards Mfg. Company, Cincinnati, will start work soon on a two-story addition to its plant on Eggleston avenue.

The plant of the Ohio Sterling Electric Company in East Dayton, Ohio, was sold at auction June 15 to Andrew Strohn, of the Pneumatic Tool Company. Future plans have not yet been given out.

The Citizens' Motor Car Company, Cincinnati, has acquired additional property adjoining its present location, on which will be erected a three-story concrete garage. It also will soon build another large garage in Hyde Park suburb that will have a completely equipped repair shop.

The New Lexington Water Company, New Lexington, Ohio, has been incorporated with \$50,000 capital stock. The incorporators are J. F. Cole, W. L. David, George A. Harrop, John M. Garfield and Frank H. Gum.

The Board of Directors of the Cincinnati Branch, National Metal Trades Association, held a meeting on the evening of June 13 and decided to give the annual outing to employees at Chester Park July 29. These outings have become a very important feature of the Cincinnati Branch and are always largely attended by both employers and employees. The attendance last year was about 36,000, and an equally large crowd is expected this year. About \$300 in gold will be awarded as prizes in various athletic and aquatic contests. The programme was arranged by Secretary J. M. Manley.

The Cincinnati Tool Works Company, Cincinnati, Ohio, is enlarging its plant so as to increase its output of radial drills, shapers and lathes. It reports a good volume of orders, but looks for an increase in the early fall.

### Chicago

CHICAGO, Ill., June 20, 1911.

The machine tool activities of the past week in this market have been brightened by the placing of a few attractive orders and by an increased number of scattering orders for one and two machines. The International Harvester Company has purchased for its Milwaukee works the machines on the list recently reported having a value of approximately \$15,000 and an automobile manufacturer at New Albany, Ind., bought several tools at a cost of about \$12,000. The five or six tools for the Rock Island Arsenal, including a planer radial drill, heavy duty drill, shaper and hack saws were also placed during the week. A Chicago manufacturer of tool holders was a purchaser during the week, which business, together with an order from a subsidiary company at the stock yards for a large planer, aggregated close to \$6,000. Country orders and miscellaneous purchases added to the above have brought the business of the first half of June up to considerably more than the total transactions in May. The American Steel & Wire Company has closed on the bids for its machine tool requirements and announcements as to the placing of orders are expected in a very few days. The Atchison, Topeka & Santa Fe also announces that it will purchase the \$25,000 of tools for which inquiry was made recently. The general manufacturing trade continues to show comparatively few new enterprises where the purchase of complete equipments of importance are required and the machine tool trade still reflects this condition quite generally.

The Chicago Ornamental Iron Works, Thirty-seventh and Stewart avenues, Chicago, will build a two-story addition to its present plant, that will cost \$30,000.

The Central Locomotive & Car Works, Chicago, incorporated under a Maine charter, with a capital stock of \$600,000, has been organized under an Illinois charter with a capital stock of \$450,000.

The American Car & Foundry Company, Chicago, will build a one-story steel hammer and forge shop at 2513 South Wood street, this city.

Bids for the construction and equipment of an electric light and power plant for the Isolation hospital at Fort Sheridan, Ills., will be received at the office of the chief quartermaster, Chicago, on June 19.

Deere & Co., Moline, expect to erect a new wagon factory at Davenport, Ia.

The Hummel-Downing Board Mill & Paper Board Company will build a \$250,000 four-story factory building at Cambridge and Thomas avenues, Milwaukee, Wis.

The machine shop of Charles Kasch, West Second street, Davenport, Ia., has been purchased by A. L. and E. Peterson. It is expected that a new location will be secured in the near future and added equipment installed.

The School Board of Grand Island, Neb., will receive bids until August 15 for heating boilers for a new school building. Tenders will be received by S. E. Sinke, secretary.

The Imboden Roller Mills, Imboden, Ark., have been purchased from J. L. McKamey, by Robt. J. L. Knie, of Cordell, Okla., and a number of improvements are contemplated.

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### Cleveland

CLEVELAND, Ohio, June 20, 1911.

The American Steel & Wire Company is placing orders for the machinery requirements for its various plants, which were contained in a list of about 70 tools amounting to over \$100,000 issued about six weeks ago. The bulk of this business is being divided between Cleveland, New York, Boston and Chicago dealers. Some fair small orders for lots of about half a dozen tools were placed during the week by industrial plants that are making extensions. Two large orders for electrical equipment for power plants were also placed. The machine tool business generally continues quiet. Inquiries are scarce, although there is some new business in prospect. Some buyers that have inquiries out are still holding off. A little business is coming from the automobile trade, but it is mostly in single tool orders. Rubber tire manufacturers are buying in a limited way. Very little business is coming from the railroads. Not much new business is in prospect in electrical lines.

The demand for second-hand machine tools is only moderate. The supply at present exceeds the demand and second-hand tools are being offered at low prices. The supply business has improved somewhat.

Contracts for the electrical equipment for the new power plant to be built at Cuyahoga Falls, Ohio, by the Northern Ohio Traction & Light Company have been let by the Cleveland Construction Company to the Westinghouse Electric & Mfg. Company. This will include two turbo generators, each 5000-kw. and a large amount of other equipment for the main generating station and six substations. Specifications for a hydro-electric plant to be built by the same company will be out shortly. Another large contract for electrical equipment was also placed during the past few days by the Cleveland Construction Company, an order being placed with the General Electric Company for a power plant to be built by Cleveland interests at Fort Worth, Texas. The specifications included two 4000-kw. generating units with accompanying equipment.

The Buckeye Aluminum Company, Wooster, Ohio, has about completed a new plant, which will shortly be placed in operation.

The Belmont Stamping & Enameling Company, New Philadelphia, Ohio, has broken ground for an addition, which will provide 20,000 sq. ft. of additional floor space. It is claimed that when the addition is completed the company will have the largest plant in the country devoted exclusively to the manufacture of porcelain enamel ware.

Bids will be received by A. B. Lea, director of public service, Cleveland, June 27, for a motor driven engine lathe for the Fairmount pumping station of the Water Department.

The Manufacturers' Rubber & Supply Company, Akron, Ohio, has been incorporated with a capital stock of \$10,000 by R. F. Dutt and others.

The Canton-Hughes Pump Company, Canton, Ohio, has its new plant in Wooster, Ohio, well under way and expects to move to its new location in the fall. The company reports a better demand for steam pumps than for some time. Its orders during the past two weeks amounted to ten car loads.

The Enamel Vitrified Brick Company, Toledo, Ohio, J. J. Urschel, manager, proposes building a number of plants where suitable deposits of sand can be found and will require in the near future a number of boilers and engines.

### The South

LOUISVILLE, Ky., June 20, 1911.

Now that the wheat crop through the Ohio Valley and the cotton crop in the further South is being marketed, money will be more plentiful through this district, and it is expected that this will have a stimulating effect on the machinery market. However, it is pointed out that money has been in plentiful supply for several months, and that lack of funds can not be considered to have been a factor in the weakened demand. During the past week a good many sales of power equipment have been made in this section, and manufacturers and dealers regard the outlook as somewhat improved.

Business is reported to be good with stove founders and agricultural implement makers in this district, favorable reports having been received from Evansville and other Ohio Valley cities where these industries are prominent.

The Louisville Cotton Oil Company has purchased

a boiler from the Babcock & Wilcox Company, New York. It is erecting a new boiler house.

Some special machinery damaged by fire in the plant of the Axton-Fisher Tobacco Company, Louisville, will have to be replaced, but officers of the company stated that contracts for it had already been let.

The Henry H. Martin Mfg. Company has filed articles of incorporation in Louisville, giving its capital stock as \$10,000. Henry H. Martin is president and the principal stockholder. The company is now erecting a foundry building, which will be completed and equipped next month. Gray iron castings will be made.

The Pigmy Mining Company, in Crittenden county, Ky., has purchased a compressor from the Ingersoll-Rand Company, a boiler from C. J. Walton & Sons, Louisville, and a washer from the American Cotton Trader Company, Joplin, Mo. It is opening a new shaft for a lead and fluorspar mine. J. E. Wright is general manager of the company.

Murray Sanders has contracted for the installation of a Diamond drill in a zinc and lead mine near Marion, Ky. The mine is being operated by a New York company of which Mr. Sanders is the representative.

The Rosa Clare Mining Company, which is developing the lead, zinc and fluorspar deposits found in southwestern Illinois and western Kentucky, has installed equipment in a large mill in Hardin county, Illinois.

William G. Probst, former superintendent of the Louisville plant of the Standard Sanitary Mfg. Company, is superintendent of a foundry which is being established at Salem, Ind. The style of the firm which is operating the plant is McCowen-Probst-Menau Company.

The Cooper-Hewett Company, dealers in electrical machinery, has removed its quarters from Bullitt and Main streets, to 759 South Preston street, which is also the address of the Electric Vehicle Company, in which H. B. Hewett, a member of the firm, is interested.

H. A. Bishop & Co., Chicago, have been given the contract for the erection of the superstructure of the addition to the power plant of the Kentucky Electric Company, Louisville. A good deal of structural steel will be required for the building.

The Greenbaum Distilling Company, Midway, Ky., has ordered the installation of several evaporators by the Vulcan Copper Works, of Cincinnati, while a contract for drying machinery has been let to the Louisville Drying Machine Company, of Louisville. The end of the distilling season has been reached, and during the idle months of the summer many of the distilling companies will have extensive improvements made in their plants. Where power equipment is not involved, copper is the chief material used in the work.

The Universal Stenotype Company, Dallas, Texas, has purchased the plant of the Hickman-Ebbert Wagon Company, Owensboro, Ky., and will operate there. It is removing its equipment from Dallas, but will likely require additional machinery.

F. H. Moors, Owensboro, Ky., has patented a new form of rotary engine, which is in operation at a local flour mill. Several Owensboro men are interested, and it is planned to market machines of this type, for which many advantageous features are claimed.

The Frankfort Water Company, Frankfort, Ky., is making improvements in its plant. A new pump has just been installed. John Griffin is superintendent of the company.

The Frankfort Modes Glass Company, Frankfort, Ky., has announced the closing of its plant and will sell its machinery, consisting of forging equipment, machine tools, including a shaper, two engine lathes, and a drill press; a 75-h.p. Atlas horizontal engine, a Westinghouse dynamo, two air compressors and other machinery.

The Brabb & Burt Lumber Company, of Ford, Ky., is going out of business and will sell the equipment of its sawmill, consisting of a large amount of power and wood-working equipment. The plant is an unusually large one.

The plow factory of the Wells-Jones Company, at Jackson, Tenn., was destroyed by fire last week, with a loss of \$10,000. It is understood that the plant will be rebuilt.

Greenville, Tenn., has approved a bond issue of \$65,000 for the purpose of establishing a municipal water works and electric light plant. Plans for the utilities will be drawn at once, and it is expected that contracts for the equipment will be placed in the next sixty days.

Following the rejection of the plans originally drawn for the new city hospital plant in Louisville, the



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specifications have been changed and the plans accepted by the commission. They will be formally approved by the General Council of the city, following which contracts will be let. The buildings will be of reinforced concrete, and will involve a large tonnage of reinforcing bars, while the commission has also provided for a power plant of large capacity.

The Mascot Stove Works, Dalton, Ga., has increased its capital stock to \$25,000. The capacity of the plant is to be enlarged.

The Morris Tool & Equipment Company has been incorporated at Rome, Ga., with \$25,000 capital stock, by George A. Morris, G. J. Davis and others.

A sawmill having a daily capacity of 25,000 ft. is to be erected near Franklinton, La., by Henry Miller, of Columbia, Miss., who has purchased a large tract of timber in that section.

A bond issue of \$7,500 has been voted at Headland, Ala., for the purpose of making improvements in the electric light plant and water works.

Brick making machinery will be installed in the plant of Seavey Bros., at Brookhaven, Miss., which have been taken over by W. H. Seavey, John H. Seavey and W. D. Davis. A new company will be incorporated.

W. D. Corley is heading a company which is being formed at Tutwiler, Miss., for the establishment of an electric light plant. It is planned to invest \$10,000.

A three-story brick building is being added to the plant of the Georgia Agricultural Works at Fort Valley, Ga. The capacity of the plant will be almost doubled.

The pipe works of the Sheffield Casting & Mfg. Company, Sheffield, Ala., which has been closed for several months, has resumed operations, and will continue to run at full capacity for several months. G. W. Gillen is superintendent of the plant.

The Alabama Power & Light Company, Gadsden, Ala., which has been incorporated with a nominal capital stock of \$1,000, plans the development and transmission of hydroelectric power to a number of cities in Northern Alabama. R. A. Mitchell, E. T. Hollingsworth, T. S. Kyle and others are the incorporators.

The Centerville Light & Power Company, Centerville, Ala., has filed articles of incorporation. Its capital stock is \$15,000.

The W. M. Cady Lumber Company is being organized with \$200,000 capital stock for the establishment of a sawmill at Glenmora, La. The plant will cost \$75,000. The contract for the installation of the power machinery has been let to the Murphy Boiler Works, New Orleans. Most of the mill machinery has also been contracted for.

The Eunice Carriage & Machine Shops, Eunice, La., is in the market for some machine tools for use in plate-bending and boring work.

The Interstate Lumber Company will rebuild its planing mill at Columbus, Miss., which was recently burned.

A sawmill is to be erected at Sumter, Miss., by the Sumter Lumber Company.

The Gulf Line Railway Company, Sylvester, Ga., is asking for bids on a 60-hp. boiler and engine. Address W. T. Hargrett, general superintendent.

### St. Louis

ST. LOUIS, Mo., June 17, 1911.

There were some indications this week of an improvement in the machinery market. There were more inquiries than has been the case in some time, while the personal calls at machinery houses of prospective buyers were more numerous. No deals of individual importance were closed during the week, but there was a fair movement of ordinary business. There seems to be a growing feeling among the dealers that there will be a decided improvement before long, though just how or when it is to materialize is not determined. There was a report on the street of the purchase of about \$30,000 worth of machinery for the use of a concern engaged in manufacturing thermostats for kitchen ranges, but no satisfactory confirmation of the statement could be gained from either side.

Two fires with losses aggregating about \$1,000,000 the past week will put several planing mills in the market at once for new machinery in the wood working class. All have announced their determination to get back into the running at once, rebuilding or renting or both. The firms affected were the Hittig Sash & Door Company, the Fathman & Miller Planing Mill Company, the Missouri Stair Company, the Mound City

Box Company and the William G. Frye Mfg. Company. All are of large size and all state that their new plants will be larger than the old ones.

W. J. Finley and others have closed for a site for a mill at Arlo Station, a suburb of St. Louis, and will construct and equip a plant for the grinding of minerals for pigments, especially silica and barytes.

The Toledo Flanner Boiler Company, Toledo, Ohio, according to J. J. Rice of that company, is preparing to establish a branch plant in St. Louis involving an investment of \$100,000 in buildings and machinery and the employment of about 1500 men.

The Unit Construction Company has purchased an 11-acre site on the western edge of the city and will establish a \$100,000 plant for the manufacture of concrete reinforcement metals and the casting of concrete forms.

The Desnoyers Shoe Company is arranging for the immediate construction of a shoe factory building with more than double its present mechanical capacity.

The Dalton Adding Machine Company has increased its capital stock by \$500,000 for the purpose of increasing its manufacturing plant at Poplar Bluff, Mo.

The Bourne-Fuller Company, Cleveland, Ohio, is reported to contemplate establishing a branch establishment in St. Louis. Its extent and machinery needs are not yet public.

The McPike Paper Company, Alton, Ill., has obtained quarters and will install machinery for a large plant in St. Louis for the manufacture of paper boxes and corrugated boxes for package purposes.

The Ludlow Saylor Wire Company has leased a down town building which will be utilized for some forms of the manufacture of wire goods now carried on in the main plant in the western part of the city.

The Reeds Lead & Zinc Mining Company, Reeds, Mo., has been incorporated with \$60,000 capital stock and will install a complete plant of mining machinery.

The Mound City Corrugated Paper Box Company is removing its factory and machinery from Cape Girardeau. The mechanical equipment will be considerably increased.

The Springfield Gas & Electric Company and the allied Springfield Traction Company, Springfield, Mo., have conducted an engineering investigation to determine the improvements required for their plants. It is expected that about 1500 kw in electrical power units with turbine drive and auxiliary apparatus will be purchased. The shop equipment will be enlarged, rolling stock increased and a considerable amount of track relaid.

Plans are being prepared by the McLaughlin Engineering Company, Kansas City, Mo., for a proposed electric lighting plant for that city to cost \$350,000. The receiving of tenders for machinery may be expected in about two months. The matter is in charge of J. A. Cable, Commissioner, Department of Water Works and Street Lighting.

The Broderick & Bascom Rope Company, manufacturer of wire rope, St. Louis, Mo., contemplates enlarging its plant and equipping it with new and modern machinery. Detailed information is not yet available.

### Indianapolis

INDIANAPOLIS, Ind., June 20, 1911.

The Motor & Mfg. Company, Indianapolis, has changed its name to the Federal Motor Works.

The Universal Portland Cement Company has under construction at Buffington, Ind., a new plant to be known as No. 6, which will have an annual capacity of 4,000,000 barrels of cement.

The Bedford Industrial Association has been organized at Bedford, Ind., to look after the industrial growth of the city. The directors are C. B. Fletcher, I. F. Hamer, W. E. Clark, Frank Allen, E. E. Farmer and C. S. Norton.

The Ideal Concrete Machinery Company, South Bend, Ind., which has increased its capital stock from \$250,000 to \$500,000, will enlarge its plant, increasing its capacity about one-third. The company already has one of the largest plants in the world. Its officers are: President, Mentor Wetzstein; vice-president and general manager, George B. Pulfer; secretary, George B. Hopkins.

The Hanna-Brackenridge Company, iron workers, has been incorporated at Ft. Wayne, Ind., with \$100,000 capital stock. The directors are S. D. Hanna, Elwood White, W. T. Brackenridge, J. J. Immel and Louis Hess.

The galvanizing department of the Atlanta Tinplate

## THE MACHINERY MARKETS

Company's plant at Atlanta, Ind., has been reopened, with 25 men. The mill has been idle for several months and most of the former employees had moved elsewhere.

The Upland Flint Bottle Company, Upland, Ind., has been incorporated with a capital stock of \$50,000. The directors are A. M. Foster, W. C. Forbes and S. L. Peterson.

Charles A. Morse has been appointed receiver for the Montpelier Cup & Metal Works, Montpelier, Ind.

The Vulcanized Roofing Company, Chicago, Ill., has taken over the factory buildings of the American Strawboard Company at Anderson, Ind., and will centralize its plants in the Indiana city.

The United States Glove Company, Marion, Ind., has increased its capital stock from \$25,000 to \$50,000.

The Heat, Light & Power Company, Muncie, Ind., which has been supplying the city with natural gas, which has become exhausted, will build an artificial gas plant.

### Eastern Canada

TORONTO, ONT., June 17, 1911.

The good features of trade become more pronounced from week to week, and any bad features that were noticeable in the spring become less and less so as the season advances. The causes of the improvement are the same that have been present from the time that navigation opened. Canada is the cynosure. Capital and population continue to flow in from abroad. Moreover, enterprise and ingenuity are busy creating uses for capital and employment for labor. Undertakings that were undreamt of for this country a decade or less ago are being gone into with the utmost confidence and find a good demand awaiting them. This enterprise is the part the American interest in the country contributes. It is quite remarkable to note the influence of this time of development upon the minds of the men who have been at the head of the country's banking business for many years. They find it impossible to adhere to their old habit of taking past experience as a precedent and regulating their operations accordingly. They realize that they have to adjust their financial focus as they go along. French capital is now being imported in large volume by a Montreal circle, the center of which is Rodolphe Farget. It would be difficult to imagine a happier conjunction of favorable influences for a country than that now shaping the fortunes of Canada. Great Britain, France, the United States are all showing a cordial interest and strong confidence in the country. If no mistakes are made by Canada's business men there will be wonderful progress here in the next few years.

The ratepayers of Whitby, Ont., have approved an arrangement for the supplying of power and light to the municipality by the Seymour Power Company.

The City Council of St. John, N. B., is considering the question of installing a garbage disposal plant at a cost of about \$50,000.

The John Marrow Screw & Nut Company, Ingersoll, Ont., has been incorporated with a capital stock of \$100,000.

Art Metals, Ltd., has been incorporated with a capital stock of \$40,000 to do business in Toronto.

The Sweet Machinery & Foundry Company, Cobalt, Ont., has been incorporated with capital stock of \$40,000.

The St. Mary's Portland Cement Company, Toronto, has been incorporated with \$500,000 capital stock.

Dominion Explosives, Ltd., has been incorporated with a capital stock of \$100,000. The principal place of business, Ottawa.

The Wayagamack Pulp & Paper Company, Montreal, has awarded to C. E. Deacon, Montreal, the contract to build a 100-ton Kraft paper mill.

Up to July 1 sealed tenders will be received by the Mayor, Oshawa, Ont., for the construction of screening chambers, sedimentation tanks, sludge beds and appurtenances.

T. S. Simm & Co., St. John, N. B., are about to call for tenders for the erection of an addition to their brush factory, to include power house, boiler house and machine shop.

The Canadian Rand Company, Sherbrooke, Que., will shortly call for tenders to build an extension to its foundry.

The Montreal Terra Cotta Lumber Company, Montreal, is calling for tenders for the erection of a terra cotta plant at Lakeside, near Montreal, at a cost of about \$150,000.

The American Cyanide Company, Niagara Falls, Ont., will duplicate its present plant and is preparing to build a factory to cost \$90,000.

The Town Council of New Glasgow, N. S., is calling for tenders for water works to cost about \$200,000.

The ratepayers of Trenton, Ont., have approved by-laws giving municipal privileges to Lloyd & Sons, who are to build a plant for making baby carriages, go-carts, etc.; to the Trenton Shirt & Collar Company, which is to erect a factory at once, and to Wier, Stahl & Co., Chicago, who are to erect a button factory in the town.

Canadian Vickers, Ltd., is incorporated by Dominion authority to do business in Canada. This is the Canadian branch of the Vickers establishment in England. The company has a capital stock of \$5,000,000. The head office is to be in Montreal. The company is empowered to manufacture steel and to engage in all branches of ship building, including the building of warships, the making of guns, ordnance and ammunition.

The Dominion Power & Transmission Company, Hamilton, Ont., has brought F. E. Frothingham, C. E., Boston, to report on extensive additions to the system to meet the demands of the city's growth.

The Board of Control, Montreal, has approved the Fire Chief's recommendation that seven automobiles be purchased at \$1400 each for use of the fire department officers.

The Sherwin-Williams Company of Canada has been incorporated by Dominion letters patent with a capital stock of \$8,000,000. The head office is to be in Montreal. The business of the existing Sherwin-Williams Company is to be taken over and expanded.

The Eastern Canada Paper & Pulp Company, Montreal, will increase its capital stock to \$15,000,000. It is to carry on business as a holding company and will apply its capital to the purchase of operating companies, whose plants are to be improved.

The City Council of Montreal is spending \$3,000,000 on public works. Water department, \$1,175,000, to cover completion of enlargement of aqueduct, \$425,000 and beginning of filtration system, \$750,000; fire department, \$336,000, to cover erection of five new fire stations, which include the purchase of five new fire engines, including two automobile engines, two chemical pumps and hose wagons combined, for use in Mount Royal and Rosemount wards, at a cost of \$7800 each; hose wagons, ladders, etc.

### Western Canada

WINNIPEG, Man., June 17, 1911.

All signs of hesitation are disappearing. Work that for some time was held in abeyance because the banks were not satisfied that conditions of trade had become settled for the season is now being financed. American money is coming in to impel operations. The immense programmes of the railways are being carried out, and these absorb a large amount of the labor that has come in this spring.

Up to July 3, tenders will be received by David Mitchell, Town Commissioner, Stettler, Alberta, for a 125-kva. generator exciter and switchboard; a tandem compound steam engine; a 72x16-in. boiler and stack; cedar poles and pole-line material; and erection of pole line.

Up to July 3, tenders will be received by the chairman of the Board of Control, Winnipeg, for the supply of apparatus and material required to install a police patrol telegraph system.

The municipality of Springfield, Man., has under consideration proposals to establish a light, heat and power service and construct an electric railway system.

Tenders for the complete construction and erection of car shops, at Winnipeg, have been called for by the Transcontinental Railway Commission, Ottawa.

Tenders will be called for by J. E. Griffiths, public works engineer, Victoria, B. C., for the construction of a bridge to cost about \$150,000 across the Columbia River at Trail, B. C.

The Grouse Mountain Scenic Incline Railway Company has been incorporated with a capital stock of \$750,000, the head office Vancouver, B. C. The road will be in the vicinity of Vancouver. The cost of equipment is estimated at \$520,900.

The Citizens' Development Committee, Port Arthur, Ont., has recommended that the granting of a site to MacKenzie, Mann & Co., for establishing a steel plant, be favorably considered by the city authorities.

It is said that the H. Mueller Mfg. Company, De-



## THE MACHINERY MARKETS

catur, Ill., is contemplating the establishment of a Canadian branch factory at Port Arthur, Ont., for making plumbers' brass goods and waterworks brass fixtures.

The International Harvester Company, Hamilton, Ont., will build at Fort William, Ont., a warehouse to cost \$125,000.

The Calgary Nail Company, Calgary, Alberta, incorporated recently by provincial letters patent, has a capital stock of \$150,000. It is to manufacture nails, galvanized iron, wire, and other articles.

It is said to be settled beyond question that Calgary will be the city chosen for the Gordon Nail Works. Lethbridge and Medicine Hat were apparently favored for a time, but Calgary has been finally preferred.

The Ocean Falls Pulp Company, Vancouver, B. C., Ocean Falls, B. C., is putting in the second installation at its plant at Ocean Falls, B. C. It now employs 500 men, and when the plant is enlarged it will have work for 700.

The Northern Engineering & Supply Company, Fort William, Ont., is building an annex to its warehouse and machine shop.

It is estimated that the Canadian Northern Railway Company will spend \$30,000,000 in the Canadian West this year.

### Texas

AUSTIN, TEXAS, June 17, 1911.

The drouth, which is having a serious effect upon the corn crop all over the State, was partly broken in some localities of the north central portion by good showers during the past week. Business conditions show some improvement, and machinery dealers afford a very hopeful outlook for a good mid-summer business. The demand for cotton ginning machinery continues unusually heavy. Cotton compresses and cotton-seed oil mills are also being improved and new plants installed. In the Bermuda onion growing districts of South Texas preparations are being made by many farmers to install new pumping plants, and the prospects are favorable for a large increase in the demand for this class of machinery during the next few months. The situation in Mexico continues more or less chaotic, and pending an absolute assurance of the stability of the present government it is probable that there will be little done in the way of industrial development in that country.

The International Railway Tie Company, New Orleans, will establish a branch manufacturing plant at San Antonio.

J. L. Driscoll and S. E. Driscoll have established a broom factory at Shiro.

The Velasco Wharf & Warehouse Company, which recently increased its capital stock from \$10,000 to \$250,000, will establish extensive terminal and port facilities at Velasco. Felix Johnson, of Houston, is at the head of the company.

W. H. Knox, Livingston, will install a lumber mill at Hemphill. He also has under consideration the construction of a railroad between Broadus and Sabintown, about 30 miles, for the purpose of affording a transportation outlet for a large tract of timber that he owns.

S. Robbins, Winnsboro, will install a plant at Greenville for the manufacture of pottery. He is operating a similar plant at Winnsboro.

The City Council will soon let the contract for the construction of a system of sewers at Mt. Pleasant, to cost about \$16,000.

The Waxahachie Gas Company has been formed at Waxahachie with a capital stock of \$125,000 for the purpose of building a gas manufacturing plant and distributing system. The incorporators are Roy Conally, E. H. Griffin, Waxahachie; Raymond St. Johns, Herbert St. Johns, William Utley and Oliver Lau, Detroit, Mich.

J. J. Cook, Hot Springs, Ark., will install a large broom factory at San Angelo, Texas.

The city of El Paso will soon install a 5,000,000-gal. pump at the water-works well upon the mesa. Five new wells will have been sunk upon the mesa by the middle of July and the flow of water increased to about 3,000,000 gal. daily. Other wells will be put down and the flow brought up to about 4,000,000 gal. daily by September.

The contract for the erection of a reinforced concrete power house building at Ballinger has been let by the city to the Sherwood Concrete & Paving Company for \$5,950. The plant will be equipped with modern machinery.

C. G. Barrett will install a woodworking plant at his lumber mill at Huntsville.

The Orange Commercial Club through Secretary S. R. Shepherd is negotiating for the establishment at Orange of a large chair factory.

The plant of the Ennis Milling Company that was recently destroyed at Ennis will be rebuilt.

The Farmers & Merchants' Gin Company that was recently formed will install a large cotton gin at Sherman. G. S. Murphy is president.

The Markham rice mill at Markham has been destroyed by fire at a loss of \$60,000. Plans for the immediate rebuilding of the mill are under way.

### The Pacific Coast

SAN FRANCISCO, Cal., June 13, 1911.

Little new inquiry for large machine tools has come out since the first of the month, but the situation in general remains satisfactory, with a steady, though gradual, increase in the number of small orders. While the local demand is very quiet, shops of more or less importance in the interior of the state are coming into the market on a larger scale, and many minor improvements are to be carried out during the summer. The need for new equipment is quite general, and purchases are being made as rapidly as financial conditions appear to warrant.

The Risdon Iron Works, of this city, which recently sold its site to outside interests, has sold its good will and uncompleted contracts to the Union Iron Works Company. Augustus Taylor, president of the Risdon Works, announces that its plant will be permanently closed about June 20. It is announced that R. H. Postlethwaite, formerly manager of the works, will continue the manufacture of mining and dredging machinery and parts for Risdon machinery now in service, under the direction of the Union Iron Works. It is uncertain what disposition is to be made of the equipment of the Risdon plant, but it is expected that a part of it, at least, will be put on the market.

The Berkeley Engineering Works, Berkeley, Cal., is erecting a large electric crane in the foundry building of the Columbia Steel Company, near Antioch.

M. C. Harris, N. R. Harris and others, who have been largely interested in the Atlas Gas Engine Company, Oakland, Cal., have withdrawn from that firm and taken control of the Corliss Gas Engine Company, operating a small plant at Petaluma, Cal. This shop will be enlarged, and after the first of the year the Corliss Company expects to install a large shop on the present site of the Atlas works, on the Oakland estuary, which is owned by the Harris interests.

The Selby Smelting & Lead Company of this city is moving into its new brick building at First and Howard streets.

Ten locomotives of the Atchison, Topeka & Santa Fe Railroad were destroyed or badly damaged a few days ago in a roundhouse fire at Seligman, Ariz.

The Okell Drill & Supply Company has been incorporated at Los Angeles, with a capital stock of \$10,000, by J. Blackwell, W. C. Weher, J. Scholtens and others.

The California Iron Works, San Diego, Cal., has filed a petition with that city for a lease of tide lands at the foot of Seventh street, the stated purpose being the installation of a marine plant.

The Hendry-Longwill Auto Machine Works has been incorporated in San Francisco, with a capital stock of \$10,000, by T. W. and E. Hendry and S. M. Samter.

The McGeorge & Cooper Mfg. Company, engaged in the manufacture of gas grates, has been incorporated at Oakland, Cal., with a capital stock of \$100,000, by W. C. McGeorge, G. D., and William Cooper, G. C. Gardiner and W. A. Boston.

The Great Western Power Company is starting preliminary work on its large power project at Big Meadows, Cal.

The Soper-Wheeler Company is planning to install a new lumber mill at Oroville, Cal.

It is announced that the Metropolitan Water & Sewerage Board, Brisbane, Australia, will receive bids, January 30, 1912, for power generating equipment and pumps to deliver 6,000,000 gal. per day against a head of 400 ft., to be installed on the Brisbane River. Bids will be taken for one, two and three-unit plants.

Lassen county, Cal., will be in the market shortly for a lot of road machinery.

Plans are being made for the renewal of the South-

Mechanical and Civil Engineers

PITTSBURGH, PA.

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ern Pacific planing mill at San Luis Obispo, Cal., which was recently destroyed by fire.

The Pacific Electric Railway, Los Angeles, has placed an order with the General Electric Company for four 1000-kw. motor-generator sets and a lot of smaller equipment.

The Yosemite Lumber Company expects to equip several logging camps near El Portal, Cal., within a few weeks, and the company is planning a sawmill of 200,000 ft. daily capacity.

The Argonaut mine, near Jackson, Cal., will shortly install electric hoisting equipment, replacing water work.

Chas. C. Moore & Co., San Francisco, have taken a contract for piping and changes in the fuel oil system of the Southern California Edison Company's plant at Long Beach, Cal., at \$10,388.

The town of La Jola, Cal., is planning to install a large centrifugal pump and gas engine for waterworks use.

A logging locomotive and band saw outfit are being shipped to the Hume-Bennett Lumber Company's mill at Hume, Cal.

H. A. Brown and C. B. McMaster have started business as the San Diego Ignition Company, San Diego, Cal., and will put in a shop for electrical and motor work.

Extensive repairs are to be made at once to the equipment of the Pacific Window Glass factory, Stockton, Cal., which was recently acquired by W. P. Fuller & Co., San Francisco, after being idle for several years.

The Union Dredging Company, Philadelphia, has let contracts for the construction of a large gold dredge to operate near Folsom, Cal., the equipment for which will be furnished by the Bucyrus Company.

Plans have been completed for a Government dredge for the Rio Vista, Cal., reclamation project, but the call for bids is not expected for some time.

Figures will be taken shortly for a gold dredge to be erected near Igo, Cal., for Curtis Russel and others of Sacramento, Cal. The cost is estimated at \$150,000.

The city of Los Angeles, Cal., will receive bids June 16 for a locomotive and a lot of dump cars.

The Hewitt Machine Company, San Francisco, agents for the Atlas Engine Works, Indianapolis, Ind., have moved from Second street, near Mission, to 12 Fremont street.

The city of Oakland, Cal., has ordered three La France steam fire engines and three combination chemical and hose wagons.

The city of Los Angeles will receive bids June 23 for repairs to the ball and tube mills of the municipal cement plant.

The American Forge Company has leased a lot on Tehama street, between First and Second streets, San Francisco.

The Faulkner-Peart Machine Shop, Woodland, Cal., has been purchased by L. C. Majors, Robert Clark and H. B. Stratton. Mr. Peart, the former proprietor, is secretary of the C. L. Best Gas Traction Company, Oakland, Cal.

Toms & Blair, sheet metal workers, San Diego, Cal., have let contracts for a two-story factory building and will install a lot of new machinery. They have taken a five-year contract for the manufacture of the Inclined Gravity Hinge, patented by Benj. Burnett and F. C. Avery, covering the Western States.

### Government Purchases

WASHINGTON, D. C., June 19, 1911.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids July 11, under schedule 3718, for one radial drill, one sensitive drill, one emery grinder, one engine lathe, one speed lathe and one shaper.

The Treasury Department, Washington, will open bids July 17 for a mechanical system of mail handling apparatus for the United States post office, St. Louis, Mo.

The Isthmian Canal Commission will open bids until June 26, under canal circular 636A, for 2 locomotive cranes, reinforcement steel bars, valves, pipe fittings, etc.

Canal circular 634 of the Isthmian Canal Commission calls for bids to be opened June 22 for cargo handling and locomotive cranes, rock skips, etc.

The Inspector of the Eighth lighthouse district, New Orleans, La., opened bids June 2 for furnishing one

crank shaper as follows: Manning, Maxwell & Moore, New York, \$250, \$314 and \$350; J. P. Kemp, Baltimore, Md., \$327; Turner Supply Company, Mobile, Ala., \$224; Fairbanks Company, New Orleans, La., \$266.30; Oliver H. Hors, New Orleans, La., \$350; L. E. Rhodes, Hartford, Conn., \$300; Griscom, Spencer Company, New York, \$317.25.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids June 13 as follows:

Schedule 3603, steam pumps for Brooklyn Navy Yard—Bidder 20, Boston Navy Yard, Boston, Mass., \$46,540; 59, M. T. Davidson Company, Brooklyn, N. Y., \$53,936; 62, George E. Dow Pumping Engine Company, San Francisco, Cal., \$76,300; 162, Newport News Shipbuilding & Dry Dock Company, Newport News, Va., \$54,624 and \$52,234, alternate; 252, Warren Steam Pump Company, New York, \$57,745, part.

Schedule 3604, for furnishing and installing fourteen marine straight water tube boilers and spare parts—Bidder 143, Mosher Water Tube Boiler Company, New York, \$219,648; 162, Newport News Shipbuilding & Dry Dock Company, Newport News, Va., \$262,000.

The Depot Quartermaster, Philadelphia, Pa., opened bids June 9 for furnishing and installing one 200-hp. water tube boiler as follows: Babcock, Wilcox Company, New York, \$5760, \$5360, without evaporation test; E. Keeler Company, Williamsport, Pa., \$5407; A. D. Granger Company, New York, \$943, Oswego boiler; \$7833, Harrisburg boiler; Parker Boiler Company, Philadelphia, Pa., \$3163; Heine Safety Boiler Company, Philadelphia, Pa., \$4533, Heine boiler; \$4363, standard front; \$4915, including self-supporting stack, \$4246, unlined stack.

### Trade Publications

**Metallographic Laboratory Apparatus.**—Sauveur and Boylston, Cambridge, Mass. Call attention to a complete line of apparatus for use in metallographic laboratories which includes a metalurgical microscope and accessories, illuminating apparatus, photomicrographic apparatus, metaloscope, electric furnaces, pyrometers and polishing apparatus and accessories. All of these are illustrated and described at some length.

**Electrical Machinery and Appliances.**—Fort Wayne Electric Works, Fort Wayne, Ind. Three bulletins and an instruction book. The first, No. 1127, illustrates and describes a line of direct current grinders and buffers which are a very good example of how compact and self-contained these tools can be made. No. 1128, superseding No. 1083, treats of a line of polyphase induction motors which are characterized by extreme simplicity of design, rugged construction, ability to withstand hard usage, absence of all moving contacts, wide adaptability under various operating conditions and high efficiency. The construction of these motors is described together with their special features and applications and the text is supplemented by illustrations. No. 1129 relates to the type K3 polyphase induction watt-hour meter which records the total energy consumed in a circuit on a single register, thus eliminating the possibility of mistakes in summing up the readings of the different meters where each phase has its own individual instrument. The special advantages claimed for this meter are absolute protection from the effects of both external and internal fields, small losses, high torque and interchangeability between two and three-phase three-wire and two-phase four-wire circuits. The instruction book No. 3048, superseding No. 3035, contains instructions for installing the type A form A oil transformers which are designed for pole use and are built in sizes ranging from 0.6 to 50 kw.

**Steam Pumps.**—The Pulsometer Steam Pump Company, 17 Battery place, New York City. Catalogue No. 17. Deals with the construction, operation and field of application of the Pulsometer steam pump, which is intended to raise water with the minimum steam consumption and the minimum attention. The adaptability of the Pulsometer, which in reality is a vacuum steam pump, for a variety of uses, is touched upon and tables of pipe sizes, loss of head, due to friction in pipes and other data on the flow and the pumping of water are included.

**Woodworking Machinery.**—Greenlee Brothers & Co., Rockford, Ill. Sectional catalogue. Illustrations and descriptive matter explain the operation of an extensive line of car shop and special woodworking machinery which includes mortisers, car post, multiple spindle and gang borers; saw benches, automatic cut-off saws, tenoners, jointers, mine timber machines and cutter heads and specialties. In planning the catalogue care has been taken to combine on one sheet the illustrations and descriptive matter relating to a particular line of tools, engravings being given on the front of the leaf while the text is given on the reverse side. In a number of cases the illustrations of the machines occupy the full dimension of the sheet, which is 9 x 11 in.

**Open Hearth Furnace Ports.**—The Blair Engineering Company, 21 Park Row, New York City. Pamphlet. Contains a brief description of the Blair patent indestructible port and bulkhead for open hearth furnaces. The special advantages claimed for this port are indestructibility, complete control of combustion and direction of the gas at all times, freedom from general repairs, increased operating speed and a saving in cost.



**Feed Water Heaters.**—Harrison Safety Boiler Works, North Philadelphia Station, Philadelphia, Pa. Engineering leaflet No. 9. Treats of the Cochrane feed water heater for heating two different supplies separately and apart. This heater is constructed in the same general way as the standard Cochrane heater except that the water chamber is divided into two parts and there are two inlets, two sets of trays, two sedimentation and filter chambers and two pump supply openings.

**Well Drilling Machinery.**—Keystone Driller Company, Beaver Falls, Pa. Catalogue No. 114. Describes with numerous illustrations an extensive line of portable cable drills for water well work and also contains a drillers' instruction book with full information concerning the operation of the machines.

**Switchboard Instruments and Air and Water Flow Meters.**—General Electric Company, Schenectady, N. Y. Four bulletins. No. 4819 is devoted to the subject of alternating current switchboard panels equipped with oil switches and suitable for general use in central stations and isolated plants. The panels are designed for use with one set of bus bars to which all the generators and the meters are connected by single throw oil switches. All of the panels are 90 in. high and are intended for use on three-phase three-wire circuits on 480 and 600 volts and frequencies of from 25 to 60 cycles. No. 4825, superseding No. 4700, illustrates and describes a line of compact and moderate size instruments for use on alternating and direct current switchboards. Dimension diagrams and illustrations showing the actual size of the scales are included. No. 4826 and 4827 deal with the water and air flow meters made by this company. These give accurate records of the amount of water or air compressed or distributed. *The Iron Age*, May 26, 1910, contained an illustrated description of a steam and air flow meter which operates on the same principle.

**Metal Sheets.**—The Stark Rolling Mill Company, Canton, Ohio. Pamphlet. Refers to Toncan metal sheets which this company manufactures in a number of sizes and styles. The pamphlet is divided into three sections, the first of which deals with the way the sheets are made with special emphasis upon the means that give the rust resisting properties. Section two is illustrative of some of the qualities and properties of the metal and shows the result of corrosion and ductility tests upon various goods made from this metal as compared with the same articles made from steel or charcoal iron. The third and last section is a catalogue listing the various Toncan metal products, which include black and galvanized sheets, caves troughs, galvanized miters, conductor pipe and fittings and roofing, siding and flashing.

**Feed Water Heater and Purifier.**—Frank L. Patterson & Co., 26 Cortlandt street, New York City. Pamphlet, entitled "Guaranteed Coal Saving." Shows how a considerable part of a fuel appropriation can be turned into a profit by employing the Patterson-Berryman feed water heater and purifier. Following a discussion of the relative merits of this heater and those of the open type, the construction and operation of the heater is described in detail with a number of illustrations of the various types. Space is also given to the Patterson hot water service heater and two styles of exhaust heads.

**Gas Heat Treating Furnaces.**—Westmacott Gas Furnace Company, Providence, R. I. Catalogue D, size 8 x 9 in.; pages, 64. Concerned with a line of heat treating furnaces which include shop and bench forges, oven furnaces, annealing furnaces, cylindrical or crucible furnaces, oil tempering furnaces, lead and cyanide hardening furnaces, furnaces for melting soft metals, tinning and galvanizing furnaces and brass melting furnaces. All of these are illustrated and a brief description of their construction and a table giving the principal dimensions and specifications is included in each case. In addition to the furnaces space is given to a description of the burners and blowpipes used in connection with these furnaces, the positive pressure blowers used in supplying the air blast and a line of pyrometers. Instructions for connecting the burners are included together with tables showing the proper heat treatment for different kinds of steel.

**Exhaust Fans.**—Sterling Blower Company, Hartford, Conn. Catalogue No. 114. Contains illustrations and descriptive matter concerning the Sterling slow speed, low power, steel plate exhausters. These are made in both single and double types for either belt or direct connected electric motor or steam turbine drives and are built in either right or left hand types with vertical and top and bottom horizontal discharge. Tables giving the dimensions for the various types of exhausters are included.

**Structural Steel.**—Berkeley Steel Company, San Francisco, Cal. Mailing card. Concerned with a few of the various types of structural steel work which this company is prepared to furnish. The lines shown include steel frame mills and factory buildings, steel bridges, frames for mine shafts and steel towers and tanks.

**Machinery.**—The Cincinnati Iron & Steel Company, Cincinnati, Ohio. Pamphlet, entitled "Pointers on Machinery." Shows the various types of machines which this company handles and briefly describes them. Among the various lines illustrated is the company's 14-in. lathe which was illustrated in *The Iron Age*, April 7, 1910, upright and sensitive drills, milling machines, clutches, shears, hand and power bending rolls, electric drills, hand power punches and shears and a complete line of woodworking machinery. An index on the first page enables the tools desired to be located readily while a number of tables of useful information complete the pamphlet.

**Portable Electric Tools.**—The United States Electrical Tool Company, Cincinnati, Ohio. Catalogue H. Covers an extensive line of portable electric tools which include hand or breast drills, an electric radial drill, a bench drill and electrically driven grinders of both the portable and bench types. All these tools are illustrated and briefly described with tables of dimensions.

**High Speed Steel.**—McKenna Brothers Brass Company, Pittsburgh, Pa. Mailing card. Shows four types of drills made from this company's Red Cut superior high grade vanadium steel.

**Grindstones.**—Richards-Wilcox Mfg. Company, Aurora, Ill. Mailing card. Illustrates two types of ball-bearing steel frame grindstones, one of which will accommodate wheels ranging from 18 to 30 in. in diameter, the change for the different sizes being made by moving a clamp.

**Manganese Steel Castings.**—Edgar Allen American Manganese Steel Company, Chicago, Ill. Pamphlet. Enumerates the different kinds of manganese steel castings made by this company. The list is arranged in alphabetical order and includes asphalt presses, brick and tile machine parts, bushings of all kinds, coal breaking machinery, chemists' supplies, dredge parts, elevator buckets, crusher parts, ore car and dock parts, rolling mill parts, steam shovel parts, log loaders, lifting magnets, buckets of the orange peel and clam shell types and wheels. Under each of the main divisions are given the different types that can be supplied.

**Oil Pressure Systems.**—The Geyser Oil Tank Company, Inc., Ft. Wayne, Ind. Pamphlet. Points out the advantages of using the Geyser system for handling oil, lubricants and liquids in railroad shops, factories, mills, garages, power plants and other manufacturing institutions. The system consists of an underground storage tank placed in a suitable location and a distributing line piped through the buildings with automatic self-measuring devices attached. These liquids are forced from the storage tank to the self-measuring devices by the application of pressure on the tank and a fixed quantity is discharge at each operation. The flow is automatically shut off when this has been done, thus preventing accidental discharge or waste. The system is described at length and the various types of devices used in connection with it illustrated. A number of typical installations are also shown.

**Rubber Hose.**—The Pennsylvania Rubber Company, Jeannette, Pa. Pamphlet. Gives general description and specification for the various types of water, steam, air brake, tank and air tool hose which this company can furnish. In addition space is also given to sheet packing, spiral piston rod packing, ring packing and gaskets and rings.

**Hand Tachometers.**—Schuchardt & Schutte, 90 West street, New York City. Folder. Refers to the use of the S. & S. hand tachometers, which can be used either as a hand tachometer or a cut meter for indicating rotative and also progressive speeds. With this instrument it is possible to see at a glance the revolutions of steam and gas engines, motors, dynamos, etc., as well as the cutting speeds of milling machines, engine lathes, planers and drilling machines. The construction of the tachometer, which is made in seven sizes, one with single range of speed and three with three different speed ranges and three with four ranges, is described, together with a list of the various speed ranges regularly furnished.

**Metal Working Machinery.**—Niles-Bement-Pond Company, 111 Broadway, New York City. "Progress Reporter" No. 22. Refers to a number of new machines which have been brought out by this company recently and include the Pond reversing motor planers which were illustrated in *The Iron Age*, July 7, 1910, the 6-ft. vertical surface grinder and a 4 x 30 in. cylindrical sizing grinder made by the Pratt & Whitney Company, illustrated descriptions of which appeared in *The Iron Age*, December 29, 1910, and January 5, 1911, respectively. Other machines included are a radial drill with direct connected adjustable speed motor drive, a Niles double end wheel press, a car box borer, a 26-in. Bement crank planer, a steam drop hammer and a multi-spindle horizontal milling machine. All of these are illustrated and the special features of their construction and the particular fields for which they are adapted pointed out.

**Sand Riddlers.**—The Deane Steam Pump Company, 115 Broadway, New York City. Bulletin No. D 16,425. Points out the advantages of using a line of sand riddlers which are intended for pneumatic, steam or electric operation. These are made in two sizes for pneumatic operation, taking ordinary 18 and 20-in. round foundry riddles, in a square style, measuring 24 x 36 in., and for mounting on a post and employing either an 18 or a 20-in. round riddle. For use in foundries not equipped with compressed air, but where electric power is available the square and the round riddlers are equipped for operation by an electric motor, the power being taken either from a crane or a lighting circuit.

**Cranes.**—Fawling and Harnischfeger Company, Milwaukee, Wis. Pamphlet, entitled "The Plant and Its Products." Size, 6 x 9 in.; pages, 48. Contains an illustrated description of the plant of this company and shows a number of views of the various types of cranes in process of construction. Space is given to the various kinds of cranes, traveling electric hoists and I-beam trolleys which can be supplied in a number of different sizes and styles. The motors and the controllers with which these cranes and hoists are equipped are illustrated, together with views of three different types of drilling machines. The illustrations of the crane show them in actual service and among these is one at the plant of the Simmons Company, which was illustrated in *The Iron Age*, May 18, 1911.

# CURRENT METAL PRICES.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—		Genuine Iron Sheets—		METALS—	
Bar Iron from Store—		Galvanized		Tin—	
Refined Iron:		Nos. 22 and 24.....	lb 5.50¢	Straits Pig .....	lb 50 @ 50 1/2¢
1 to 1 1/4 in. round and square.....		No. 26.....	lb 6.00¢	Copper—	
1 1/2 to 4 in. x 1/4 to 1 in.....		No. 28.....	lb 7.00¢	Lake Ingot .....	lb 14 @ 14 1/4¢
Rods—% and 11-16 round and square.....		Corrugated Roofing—		Electrolytic .....	lb 13 1/2 @ 14 ¢
Angles:		2 1/2 in. corrugated.....		Casting .....	lb 13 1/2 @ 14 ¢
3 in. x 1/4 in. and larger.....		No. 24.....	100 sq. ft. \$3.75	Spelter—	
3 in. x 3/16 in. and 1/4 in.....		No. 26.....	100 sq. ft. 2.85	Western .....	lb 6 1/2 @ 6 1/2 ¢
1 1/2 to 2 1/2 in. x 1/4 in.....		No. 28.....	100 sq. ft. 2.50	Zinc—	
1 1/2 to 2 1/2 in. x 3/16 in. and thicker.....		Tin Plates—		No. 9, base, casks..	lb 7 1/4 @ Open.. lb 8 1/4 ¢
1 to 1 1/4 in. x 3/16 in.....		American Charcoal Plates (per box)		Lead—	
1 to 1 1/4 in. x 1/4 in.....		"A.A.A." Charcoal:		American Pig.....	lb 5 1/4 @ 5 1/4 ¢
1/4 x 1/4 in.....		IC, 14 x 20.....		Bar .....	lb 6 1/2 @ 6 1/2 ¢
1/4 x 1/4 in.....		IX, 14 x 20.....		Soldier—	
1/4 x 1/4 in.....		A. Charcoal:		1/2 & 3/4, guaranteed.....	lb 27 1/2 @ 28 ¢
1/4 x 1/4 in.....		IC, 14 x 20.....		No. 1 .....	lb 25 1/2 @ 26 ¢
1/4 x 1/4 in.....		IX, 14 x 20.....		Refined .....	lb 24 1/2 @ 24 1/2 ¢
Tees:		American Coke Plates—Bessemer—		Prices of Solder indicated by private brand vary	
1 in.....		IC, 14 x 20.....		according to composition.	
1 1/4 in.....		IX, 14 x 20.....		Antimony—	
1 1/2 to 2 1/2 x 1/4 in.....		American Terne Plates—		Cookson .....	lb 10 1/4 ¢
1 1/2 to 2 1/2 x 3/16 in.....		IC, 14 x 20.....		Halletts .....	@ 10 ¢
3 in. and larger.....		IX, 14 x 20.....		Other Brands.....	@ 9 1/2 ¢
Beams.....		Seamless Brass Tubes—		Bismuth—	
Channels, 3 in. & 4 larger.....		List November 13, 1908.....		Per lb .....	\$2.00 @ \$2.25
Bands—1 1/4 to 6 x 3/16 to No. 8.....		Brass Tubes, Iron Pipe Sizes—		Aluminum—	
"Burden's Best" Iron, base price.....		List November 13, 1908.....		No. 1 Aluminum (guaranteed over 99% pure), in	
Burden's "H. B. & S." Iron, base price.....		Copper Tubes—		Ingots for remelting.....	.21¢ and 23¢
Norway Bars.....		List November 13, 1908.....		Rods & Wire.....	Base Price 31¢
Merchant Steel from Store—		Brazed Brass Tubes—		Sheets .....	Base Price 33¢
per lb		List February 1, 1911.....		Old Metals—	
Bessemer Machinery.....		High Brass Rods—		Dealers' Purchasing Prices Paid in New York.	
Toe Calk, Tire and Sleigh Shoe.....		List February 1, 1911.....		Copper, heavy and crucible.....	10.50 to 10.75
Best Cast Steel base price in small lots.....		Roll and Sheet Brass—		Copper, heavy and wire.....	10.25 to 10.50
Sheets from Store—		List February 1, 1911.....		Copper, light and bottoms.....	9.25 to 9.50
Black,		Brass Wire—		Brass, heavy.....	7.00 to 7.25
One Pass, C.R. R. G.		List February 1, 1911.....		Brass, light.....	5.50 to 5.75
Soft Steel, Cleaned.....		Copper Wire—		Heavy machine composition.....	9.00 to 9.25
No. 16.....		Base Price,		Clean brass turnings.....	6.75 to 7.00
Nos. 18 to 20.....		Carlond lots mill 13 1/2 ¢		Composition turnings.....	7.75 to 8.00
Nos. 22 and 24.....		Copper Sheets—		Lead, heavy.....	3.75
No. 26.....		Sheet Copper Hot Rolled, 16 oz. (quantity		Lead, tea.....	3.50
No. 28.....		lots) .....		Zinc, scrap.....	4.00
Russia, Planished &c.		Sheet Copper Cold Rolled, 1¢ lb advance			
Genuine Russia, according to assort-		over Hot Rolled.....			
ment .....		Sheet Copper Polished 20 in. wide and			
Patent Planished, W. Dewees .....		under 1¢ square foot.....			
Wood.....		Sheet Copper Polished over 20 in. wide, 2¢			
Galvanized		square foot.....			
Nos. 12 and 14.....		Planished Copper, 1¢ square foot more			
No. 24 .....		than Polished.....			
No. 26 .....					
No. 28.....					
No 20 and lighter 36 inches wide, 25¢ higher.					

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